COMMENTS OF THE VIRGINIA CHAPTER OF THE SIERRA CLUB ON PROPOSED CO_2 BUDGET TRADING PROGRAM

The Virginia Chapter of the Sierra Club, which has over 21,000 members, supports Virginia's adoption of regulations implementing a "CO_2 Budget Trading Program" for electric power plants. The proposed rule represents an important advance in protecting Virginia's citizens, environment and economy. It should be approved and implemented with the modifications suggested by these comments. *Specific language suggestions are contained in the body of these comments and in Appendix B.*

OVERVIEW

The proposed rule is consistent with existing law and takes an essential step toward protecting Virginians and the Commonwealth of Virginia from the adverse health, environmental and economic impacts from climate change and ocean acidification caused by human emissions of carbon dioxide (CO_2). Promptly commencing CO_2 reductions in conjunction with an established interstate trading market will mitigate the economic harms that would result from delaying action to reduce CO_2 emissions; and it will also promote significant opportunities for economic growth, as has been observed in states participating in the Regional Greenhouse Gas Initiative (RGGI). Multiplying the benefits from acting now, reducing CO_2 emissions will improve Virginia residents' health by also reducing other pollutants from fossil fuels that are known to harm human health and property.

The **main body of these comments** will focus on the terms of the proposed rule and how it should be improved. **APPENDIX A** briefly summarizes the science supporting action to cut CO_2 emissions, as well as the health, environmental and economic benefits from promptly approving and implementing a CO_2 Budget and Trading Program. **APPENDIX B supplements the main text with** several specific suggestions for wording changes that address our substantive recommendations and needed clarifications of the draft regulations.

In summary, we urge that Virginia DEQ:

- Promptly approve and implement the proposal to limit and reduce CO_2 emissions and to link Virginia's emissions allowances to the well-established carbon market of the RGGI states.
- Establish an initial control period baseline emissions level below 30 million short tons, not 33-34 million short tons, with an update in early 2019 based on then-current information.
- Require all power plants that burn any quantity of biomass—particularly wood-based biomass—to obtain CO_2 allowances to cover their very real and harmful CO_2 emissions.
- Require that annual reductions of CO_2 allowances continue beyond 2030, until changed by rule or until a 90% reduction has been achieved or until Virginia at least achieves CO_2 reductions that are equivalent to those achieved in states that have been RGGI members from the beginning. At minimum, the rule should make clear that emissions will continue to be reduced at a rate at least as stringent as that agreed to by the RGGI states for post-2030 emissions in subsequent RGGI

program reviews to enable Virginia to continue to link its carbon program with RGGI.

- Protect communities living in proximity to and downwind of CO_2-emitting power plants by monitoring, studying and remedying environmental justice issues, including any increases in concentrations of co-pollutants (*e.g.*, SO2, smog, mercury, and other toxics) resulting from patterns of allowance utilization by such power plants.
- Measure the 25 MWe threshold for existing generation based on an "on or after" date in order to avoid the potential for manipulation.
- Extend the rule to ***new*** units serving generators of 15 MWe or larger in order to send regulatory and price signals to new units and to discourage gaming that would size or configure new generators just below the 25 MWe threshold in order to evade a price on CO_2 emissions.
- Monitor recipients' uses of revenues from consigned allowances to determine whether they are used for the purposes of the rule or whether further action is needed.
- Consider allowing Dominion's Mt. Storm facility to opt-in to the program even though it is located in West Virginia, just over the state line.
- Incorporate various additional clarifications to assure that the rule functions as intended, e.g., concerning the status and handling of CO_2 conditional allowances, determinations of exemptions, net electric output monitoring and compliance use of allowance issued by other RGGI states.

RECOMMENDATIONS FOR THE FINAL RULE

A. The Virginia Sierra Club Supports Virginia's Proposal to Link to RGGI and Core Features of the Proposed Rule.

Virginia's proposal to develop a CO_2 Budget Trading Program that can be linked to the existing RGGI program is an appropriate mechanism to begin reducing CO_2 emissions in Virginia. Although improvements should be made as discussed in subsequent sections, the Virginia Sierra Club supports action to limit and reduce CO_2 emissions from power plants in the Commonwealth and to link to RGGI's larger market. The proposal's goal of reducing CO_2 by 30% from 2020 through 2030, at an annual rate equal to 3% of the base year allowances, is modest and can readily be achieved as demonstrated by planned actions that will reduce emissions and by actual experience in the RGGI states. Importantly, the proposal intends to achieve *actual CO_2 reductions*, not reductions in "carbon intensity" which can disguise emissions increases (or inadequate decreases) as "decreases" in the "rate" of emissions-per-MWH of generation. Dangerous climate change is driven by actual CO_2 emissions and atmospheric CO_2 levels, not the "intensity of emissions."

Linking to RGGI is an Appropriate Path Forward for Virginia's Carbon Reduction Program While Virginia could potentially implement CO_2 reduction requirements without tradable emissions allowances, linking Virginia's proposed carbon reduction plan to RGGI is a good choice. RGGI's market has been in place since 2009. Through 2016, RGGI states had

reduced CO_2 emissions from covered power plants by 40% from 2008, the year before RGGI's program began.[1] RGGI reduced CO2 emissions at faster rates and with lower costs and greater benefits than was predicted prior to its implementation. Moreover, studies have shown that those emissions reductions were achieved while customers' bills were reduced and while the economies of participating states grew.[2] Further, the resulting reductions in air pollution in RGGI states have improved health outcomes for residents in those states and nearby areas.[3]

RGGI's program has been so successful that its member states recently agreed to build upon CO_2 reductions already achieved, so that covered sources reduce CO_2 by an additional 3% per year for ten years between 2020 and 2030—achieving an overall reduction of more than 65% compared to its initial 2009 cap.[4] New Jersey, which temporarily withdrew, has decided to rejoin RGGI with strong public support, including support from Republican and Democratic candidates for governor.[5] RGGI's program has proven to be popular with residents in RGGI states.[6]

Virginia will benefit from joining RGGI's auction market. Joining this established CO_2 market will help Virginia reduce CO_2 smoothly and cost-effectively, and it would avoid the potential pitfalls from implementing a Virginia-only market dominated by one company that generates most of the electricity in the state. The market for allowance trading will enable power plant operators to buy or sell allowances as appropriate to their individual circumstances, while aggregate CO_2 emissions decline. Since RGGI is both very successful and the only functioning CO_2 market in the Eastern United States, it would make no sense to reinvent the wheel or go it alone.

The Sierra Club favors the model used by RGGI member states in which power plant owners purchase allowances at auction or in secondary markets with the states using auction revenues to promote energy efficiency, renewable energy, and other measures to further reduce electric sector greenhouse gas emissions and to benefit communities most heavily burdened by power plant pollution. The Sierra Club encourages Virginia to incorporate these features to the maximum extent practicable. Implementing investments in clean energy measures, including efficiency, will help Virginia's economy with jobs, lower energy bills, and avoidance of a future GHG-reduction cliff that will face states that delay action to reduce CO_2 emissions. According to a recent study, aggressively building more solar energy capability has the potential to create

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[1] Acadia Center, Outpacing the Nation: RGGI's Environmental and Economic Success (Sept. 2017), at 4, available at http://acadiacenter.org/document/outpacing-the-nation-rggi/.

[2] Acadia Center (2017) at 5-7.

[3] Acadia Center (2017) at.5; Abt Associates, Analysis of the Public Health Impacts of the Regional Greenhouse Gas Initiative 2009-2014, http://abtassociates.com/AbtAssociates/files/7e/7e38e795-aba2-4756-ab72-ba7ae7f53f16.pdf

[4] RGGI Announcement, "RGGI States Announce Proposed Program Changes: Additional 30% Emissions Cap Decline by 2030" (Aug. 23, 2017).

[5] Both candidates, Philip Murphy (D) and Kim Guadagno (R) were on record supporting rejoining RGGI. http://www.philly.com/philly/news/politics/nj/Candidates-for-New-Jersey-Governor.html. Following his inauguration, Mr. Murphy, issued an executive order directing steps to rejoin RGGI. http://nj.gov/governor/news/news/562018/approved/20180129a_eo.shtml .

[6] **"**The Northeast's emissions reduction program is a big hit with voters**"** ThinkProgress (August 2016).

50,000 jobs in Virginia, while Virginia's 2016 Update to its Energy Plan states that a robust energy efficiency policy could increase employment by 38,000 jobs by 2030.[7]

Under a consignment auction approach, as has been proposed in Virginia, the value of allowances will go to covered power generators, and utilities will be able to use the funds, subject to regulatory oversight, to reduce electricity rates and to support incremental investments in zero-carbon energy sources and energy efficiency. Such zero-carbon energy investments will further mitigate electric energy costs by reducing fuel purchase requirements. In its 2017 Integrated Resource Plan (IRP) proceeding, Dominion acknowledged that solar costs have fallen dramatically and that solar is now the cheapest form of energy.[8] *Both utility and non-utility generators should be required or encouraged to invest such funds in renewable energy and energy efficiency, or, at minimum, to pass consignment revenues through to retail customers. The allocations of conditional allowances can be reconsidered if consignment revenues are not used to advance the rule's goals.*

The Proposed CO_2 Reductions Are Readily Achievable.

The emission reductions contemplated by ED11 are readily achievable. RGGI's market began full operations in 2009. By 2012-2014, the average annual CO_2 emissions from the baseline implemented in 2009 had been reduced by 35.7%; and annual emissions in 2016 were 40% below those in 2008, just before RGGI's market began.[9] Those reductions occurred in far less than 10 years, and RGGI reduced caps to reflect the more rapid progress. As noted above, RGGI is now planning to reduce its CO_2 cap by an additional 3%/year from 2021-2030,[10] thereby achieving a 65% reduction from its initial 2009 allowance cap.[11]

Significantly, American Electric Power (AEP)--the parent of Virginia's second largest utility, Appalachian Power Company (APCO)--recently announced its voluntary commitment to reduce its CO_2 emissions from power production by 60% from 2000 levels by 2030 and by 80% by 2050:

> American Electric Power announces new intermediate and long-term carbon dioxide (CO_2) emission reduction goals, based on the output of our resource plans, which take into account economics, customer demand, regulations, and grid reliability and resiliency.

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[7] The Solar Foundation estimates that Virginia could add 50,000 jobs by building enough solar over five years to meet 10% of its demand. See http://www.thesolarfoundation.org/wp-content/uploads/2017/10/TSF_VAFactSheet_FINAL4.pdf ; Commonwealth of Virginia Department of Mines, Minerals, and Energy, *Virginia Energy* Plan (Richmond, VA: 2014), https://www.dmme.virginia.gov/DE/LinkDocuments/2014_VirginiaEnergyPlan/VEP2014.pdf. https://commerce.virginia.gov/media/7935/energy-in-the-new-virginia-economy-update-to-the-2014-energy-plan.pdf

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[9] Acadia Center, Outpacing the Nation: RGGI's Environmental and Economic Success (Sept. 2017), at 4, available at http://acadiacenter.org/document/outpacing-the-nation-rggi/.

[10] RGGI Press Release, "RGGI States Announce Proposed Program Changes: Additional 30% Emissions Cap Decline by 2030 (Aug. 23, 2017).

[11] Id.

> The intermediate goal is a 60 percent reduction from 2000 CO_2 emission levels by 2030, and the long-term goal is an 80 percent reduction from 2000 levels by 2050. [12]

Its planned CO_2 reductions will be achieved through increased reliance on wind and solar energy, retirements of coal-fired plants, natural gas, greater energy efficiency and grid modernization, and the reductions are to be achieved even as electric demands may increase with greater electrification of the economy (*e.g.*, to serve electric vehicles).

Although AEP's planned reductions fall short of what will ultimately be needed to adequately mitigate global warming (to 1.5°C or "well below" 2°C), they nevertheless illustrate that willing electric utilities can substantially reduce CO_2 emissions, consistent with customer and shareholder interests:

> Our customers want us to help them achieve their clean energy goals while providing reliable and affordable power. Our investors want us to protect their investments in our company and deliver attractive returns, and they expect us to manage climate change-related risks. Our strategy and resource planning process allows us to deliver on both counts.

AEP explains that its new clean energy strategy is driven *by investors, business risks and the known need to reduce CO_2* in order "to limit the global average temperature rise to less than 2 degrees Celsius above pre-industrial times":

> During the past two years, the discussion began shifting from climate change as a largely environmental risk to one that is increasingly a financial, strategic, operational, public policy, and regulatory risk. Our investors are concerned about climate change-related risks that could impact their holdings…
>
> In addition to being consistent with AEP's current resource plans, these goals are consistent with the intent to limit the global average temperature rise to less than 2 degrees Celsius above pre-industrial times. Although the United States is not a party to the Paris Climate Accord [*sic – it remains a party until at least November 2020 and the Paris Accord's goal is "well below" 2°C*], stakeholders continue to use the 2 degree target as a framework for evaluating carbon reduction plans.

In 2017, Detroit Edison's CEO also announced plans to reduce CO_2 emissions by 80% by 2050: "We have concluded that not only is the 80 percent reduction goal achievable — it is achievable in a way that keeps Michigan's power affordable and reliable….There doesn't have to be a choice between the health of our environment or the health of our economy; we can achieve both."[13]

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[12] American Electric Power, A Strategic Vision for a Clean Energy Future 2018 (February 2018). According to its announcement, AEP reduced its CO emissions by 38% from 2007 to 2016, and plans to reduce emissions another 29% from that level by 2030—even without a regulation compelling it to do so.

[13] "Mich. utility to close power plants, slash emissions," https://www.eenews.net/eenewspm/2017/05/16/stories/1060054642

In short, the regulations proposed for Virginia are modest, achievable and reflect the unquestionable need to shift to clean energy as soon as practicable in order to mitigate climate impacts.

B. Modifications to the Proposed Rule Will Improve the Outcome, Better Protect Public Health, and Advance Climate Progress.

While the proposed rule is on the right track, modifications are warranted in order to better achieve the proposal's objectives and to better protect the public. **(Appendix B suggests additional regulatory language.)**

1. The Initial Control Period's Baseline Emissions Should Be Initially Set Below 30 Million Short Tons And Updated in Early 2019 Based Upon Newer Information.

The mix of generation and emissions is changing rapidly and will change more by 2020. **The pending proposal to set an initial aggregate cap of 33-34 million short tons for 2020 is much too high and already well out of date.** Setting too high of an initial cap will distort RGGI's markets by artificially inflating the pool of allowances. It would fail to produce real reductions in CO_2 from Virginia power plants and could lead to higher emissions in both Virginia and RGGI's member states.

The Virginia Sierra Club believes that the 2020 allowance cap should be set below 30 million short tons, subject to updating the 2020 level in a proceeding to be held in early 2019. Updating the 2020 baseline based on the latest available information would be fair to the public and all parties. At the same time, setting a presumptive cap below 30 million tons would reflect the most current information and would give better planning notice to owners of budget sources than clearly overstated estimates of 33-34 million tons. **However, if the baseline is set at 33-34 million tons, then the annual rate of reductions should be increased to 3.5% per year, which would still be slower than RGGI's average annual reduction over its first 10 years.** [14]

(a) <u>Known and foreseeable fuel generation changes are rapidly changing the appropriate 2020 baseline</u>

(i) The fossil fuel mix is changing rapidly as natural gas displaces coal

Changes in the fuel mix are occurring now and more changes are expected. The 2020 baseline should take into account all planned and anticipated fossil fuel retirements and deactivations between now and 2020. It should also recognize that approved new natural gas facilities will displace emissions from coal plants that remain open.[15]

[14] As between 33 and 34 million tons, 33 is clearly better than 34 for the reasons outlined in these comments.

[15] Natural gas emits less CO□ when combusted than coal does. Dominion's planned Greensville plant can be expected to reduce a large share of emissions from coal plants that continue to operate, not just those that are shuttered. This is important for setting the 2020 cap, but not an endorsement of natural gas whose associated

According to EIA data,[16] between 2016 and 2017, natural gas use in Virginia's "electric power sector" (electric utility plus IPP utility scale generation) rose, while coal-combustion fell and retail sales fell as well:

Virginia	2016 (MWH)	2017 (MWH)	Change MWH&%
Generation with Natural gas	40,266,000	46,060,000	+5,794,000/+14.4%
Generation with coal	16,214,000	10,605,000	-5,609,000/-35.2%
Total generation	89,649,000	90,666,000	+1,017,000/+1.1%
Retail sales	112,281,000	110,978,000	-1,303,000/-1.2%

From 2016 to 2017, the capacity factors of two of Virginia's largest coal-fired plants (Clover and Chesterfield) dropped by over 40%, and the CO_2 emissions just from those plants dropped by 4,989,186 short tons, from 11,783,154 in 2016 to 6,793,968 short tons in 2017.

Recent additions of natural gas-fired generation have occurred and more are expected, including Dominion's Greensville plant. As these plants come on stream, they will continue to push out dirtier coal-fired plants. Traditional coal plants emit roughly 2.75 times as much CO_2 per MWH than new combined cycle plants, so the trend is toward a much lower CO_2 baseline in 2020. We estimate that the addition of the Greensville plant could displace 7 million tons of CO_2 from coal plants even at a modest 70% capacity factor.

Beyond 2017, a number of retirements are expected. In its 2017 Integrated Resource Plan (IRP), Dominion discussed the timing of a number of potential fossil fuel plant retirements.[17] Thereafter, on January 16, 2018, Dominion announced a number of retirements by filing with PJM deactivation requests for nine fossil fuel units: Possum Point 3 & 4, Bellemeade, Bremo 3 & 4, Mecklenberg 1 & 2, and Chesterfield 3 & 4, with requested deactivation dates between April 16 and December 1, 2018.[18] Collectively, these nine units have a combined nameplate capacity of over 1,700 MW and emitted around 2.4 million short tons of CO_2 in 2016, or 7 percent of the state's reported power emissions.[19]

In addition, Dominion previously announced the planned retirement of Yorktown 1 & 2 in March of 2018.[20] The merchant plants Spruance and Edgecombe Genco have also notified

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methane leaks compound our climate problems. Methane is an extremely powerful GHG over the near term—which extends to the long-term as those emissions continue.

[16] EIA, Electric Power Monthly February 2018 (with year-to-date data through December).

[17] *See, e.g.*, Virginia Electric and Power Company's Report of Its Integrated Resource Plan, Case No. PUR-2017-00051 (May 1, 2017), at 142.

[18] *See* PJM List of Future Deactivation Requests (updated Feb. 2, 2018), available at http://www.pjm.com/-/media/planning/gen-retire/pending-deactivation-requests.ashx?la=en.

[19] *See id;* Emissions data reflects 2016 unit-level reported emissions from S&P Market Intelligence (*subscription required)* as reported to the U.S. EPA Continuous Emissions Monitoring System (CEMS).

[20] *See id.*

PJM of their intent to retire in 2019 and 2020, respectively.[21] Combined, this merchant capacity reflect another 300 MW of capacity and 1 million tons of annual CO_2 emissions.[22]

These announced retirements (which would account for 3.4 million tons of CO_2) and any other planned retirements or cold storage of units should be incorporated into calculation of the 2020 baseline.

To get a sense of the impact of retirements on the appropriate baseline, we looked at data for units that operated in 2016-2017 and are not scheduled for retirement In doing so, we found that **2017 CO2 emissions from covered fossil-fuel units that will still be operating in 2020 were approximately 29 million short tons and the trend was downward, particularly for coal-fired units.** More details about the list of covered plants and assumptions in the following table are provided in Appendix C.

Table 2. 2016-2017 Electricity Generation & CO2 Emissions for

ED11-Covered Sources Expected to Still be Operating in 2020

	Net Generation (GWh)			CO2 Emissions (1000 Short tons)		
Sector	2017	2016	% Change	2017	2016	% Change
ED 11 Plant Totals	52,276	54,105	-3.4%	29,011	33,779	-14.1%
ED 11 Coal Plants (4)	10,141	14,857	-31.7%	10,982	15,925	-31.0%

Displacing more coal-fired generation with Greensville NGCC, efficiency and renewable energy will likely push the appropriate baseline even lower, possibly much lower.

(ii) New renewable energy is changing the mix

Additionally, the 2020 baseline should fully incorporate planned renewable energy developments in Virginia through 2020. Energy from utility scale solar and wind is cheaper than from fossil fuels, and many customers are willing to provide the capital for small-scale solar. Generating energy with solar and wind produces no CO_2. The estimates should reflect the improved prospects for renewables, which were boosted by recent legislation as well as by the low cost of solar and wind generation.[23]

According to the Virginia Solar Energy Development and Energy Storage Authority Annual Report (November 2017), there are presently 219 MW of solar installed in the

[21] *See* PJM List of Future Deactivation Requests (updated Feb. 2, 2018), available at http://www.pjm.com/-/media/planning/gen-retire/pending-deactivation-requests.ashx?la=en.

[22] *See id;* Emissions data reflects 2016 unit-level reported emissions from S&P Market Intelligence (*subscription required)* as reported to the U.S. EPA Continuous Emissions Monitoring System (CEMS).

[23]

Commonwealth and an additional 2,703 MW under development.[24] The PJM queue identifies eight solar projects with a combined nameplate capacity of 717 MW with projected in-service dates between the fourth quarter of 2018 and the fourth quarter of 2020 that would interconnect in Virginia.[25]

It is likely that additional solar will be added through 2020 or soon thereafter as a result of third-party investments or arrangements with utilities, such as the agreement between Dominion and Amazon to install solar to meet the customers clean energy goals. Microsoft, for example, has agreed to purchase most of the electricity from a new 500 MW solar facility to be built by an independent provider in Spotsylvania County.[26] In addition, recent legislation call for approximately 5.5 GW of solar generation by 2028.[27] These developments must be fully accounted for in developing the baseline.[28]

Since Dominion serves an integrated system in Virginia and North Carolina, with most of its generation located in Virginia, the 2020 cap should also take into account solar connected to Dominion's system in North Carolina which will tend to reduce Dominion's need to generate energy in Virginia, as well. In this regard, Dominion receives substantial quantities of solar-generated power in North Carolina from its facilities and third parties.[29]

Dominion has emphasized the growing electric demand for data centers. However, such loads are specifically asking for renewable energy that will reduce their carbon footprint. Those loads will add more to zero-carbon generation than to fossil fuel generation. A group of data companies submitted a September 25, 2017 letter to the SCC, in Dominion's IRP docket (PUR-2017-00051). They asked regulators "to take our energy resource preferences into account when deciding on future energy infrastructure projects to meet energy load growth from data centers." Citing economic, environmental and market needs, they explained why they wanted more renewable energy and why the 2017 IRP "again under-deploys renewable energy":

Data center companies and customers recognize the benefits of renewable energy to help

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[24] Virginia Solar Energy Development and Energy Storage Authority Annual Report (Nov. 28, 2017), Appendix C. https://rga.lis.virginia.gov/Published/2017/RD563/PDF (The report includes some data only through September and is concerned that some reporting was incomplete.)

[25] PJM Generation Queue:Active, http://www.pjm.com/planning/generation-interconnection/generation-queue-active.aspx.

[26] http://www.fredericksburg.com/news/local/spotsylvania/massive-solar-farm-proposed-in-spotsylvania/article_90aef064-ff0f-5d38-96dd-230e95675019.html

[27] And Dominion in its 2017 IRP announced plans to develop 5.2 GW of solar in the coming years, including 240 MW of solar in 2019 and an additional 240 MW of solar in 2020 under all 2017 Alternative Plans. Dominion 2017 IRP at 13, Fig. 1.4.2.

[28] Recent legislation in Virginia would further add over 5,000 MW of renewable wind and solar energy while tripling energy efficiency investments in the Commonwealth through 2028. These potential increases in zero emissions resources have also not yet been fully incorporated into modeling runs, and would support an even lower baseline emissions cap for Virginia in 2020. *See* Governor Northam Statement on Rate Freeze Repeal Legislation (press release) (Feb. 5, 2018), available at https://governor.virginia.gov/newsroom/newsarticle?articleId=25402.

[29] See, e.g., https://www.dominionenergy.com/about-us/making-energy/renewables/solar-generation/north-carolina-solar-projects; https://solarbuildermag.com/news/how-dominion-energy-went-from-zero-to-1-3-gw-of-solar-in-virginia-north-carolina-in-two-years/ .

> control energy costs and achieve price predictability. We are also driven by our investors, who are also asking us to use renewable energy and reduce our carbon footprint. Renewable energy is the preferred source of power for many Virginia data center Operations….We have made public commitments, including to our investors, to reduce our greenhouse gas footprint and invest in renewable energy—in some instances, to procure 100 percent renewable energy for our operations. We intend to successfully fulfill our commitments to renewable energy and would like more options to procure it in all of the states where we operate. Access to direct renewable energy options is an increasingly significant factor in deciding where to locate or expand new data centers.

Thus, demands by Amazon, Microsoft and others for solar energy will limit future CO2 increases even if load grows. This should be considered in setting a baseline below 30 million tons.

(b) Flattening of Virginia retail loads

Electric loads have flattened in recent years. In fact, as noted above, Virginia's retail electricity usage declined between 2016 and 2017.[30]

To the extent DEQ's analysis of the potential 2020 cap (34 v. 33 million tons) relies on Dominion's load forecasts, it should step back. **Dominion's forecasts of load growth have been consistently overstated and wrong. They are not a reliable basis for regulations**. As explained in 2017 testimony analyzing the load forecasts underlying Dominion's 2017 IRP, Professor William Shobe of the University of Virginia's Batten School of Leadership and Public Policy stated:

> The recent history of the Company's energy demand forecast shows a very strong pattern of upward bias. In fact, the Company's forecast has been high for every year at every forecast horizon since 2012. This means that the Company has over-forecasted demand in every single period for which data is available.
>
> The size of the over-forecast rises dramatically with time…. Not only are all of Dominion's forecasts higher than the actual values, the size of the errors escalates rapidly. By just two years out from the forecast date, Dominion's errors are at least 5%. By three years out, the errors are all larger than 7.5%. This is true whether weather-normalized or actual data is used. This is a substantial error for such short time horizons, and it escalates rapidly with each additional year.[31]

Professor Shobe, an economist and former head of the Economic Regulatory and Analysis Division of the Virginia Department of Planning and Budget, summarized his analysis with these observations:

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[30] https://www.eia.gov/electricity/monthly/epm_table_grapher.php?t=epmt_5_04_b .

[31] Testimony of Dr. William Shobe, filed August 11, 2017 in State Corporation Commission Of Virginia, Case No. PUR-2017-00051, In re: Virginia Electric and Power Company's Integrated Resource Plan filing pursuant to Virginia Code § 56-597 *et seq., p.3.* Testimony by James F. Wilson, an expert witness sponsored by the Environmental Respondents, reached the same broad conclusions as Professor Shobe.

> The Company's electricity demand forecast is highly inaccurate and methodologically flawed. For reasons well-understood, the forecast greatly overstates growth in demand.
>
> The demand forecast drives much of the rest of the analysis in the Company's Plan; all of the rest of the analysis depends quite explicitly on the demand forecast. Because the Company uses the forecast for long-term capital planning, a forecast with a large and consistent upward bias will likely result in poor capital planning choices and must be seen a damaging to the public interest. As a result, the Company's entire planning analysis laid out in its Plan is based on an incorrect foundation in expected future demand.[32]

Virginia's baseline should also account for the Commonwealth's significant untapped energy efficiency potential and reflect savings that can and should be achieved by 2020 and beyond. Electricity generators should not get a higher CO_2 cap for 2020 because Virginia's utilities badly failed to meet the goal for efficiency-driven demand reductions of 10% compared to 2006 demand—a reduction of 10.67 million MWH annually—which was called for by the General Assembly and the Governor.

- Through 2015, Virginia's utilities had achieved less than 10% of the legislature's 10% goal and were reportedly on track with existing programs to achieve roughly 24% of the goal by 2020—*i.e.*, an additional 1.5 million MWH/year reduction from the end of 2015.[33] Achieving a 24% reduction would put the utilities 1.5 million MWH closer than at the end of 2015 but still leave Virginia nearly 8.1 million MWH/year short of the state's goal. Depending on the fuels displaced, an additional 8.1 million MWH/year reduction could equate to more than 8 million short tons of CO_2/year, and even the expected 1.5 million MWH of incremental demand reductions by 2020 would significantly reduce the baseline number.
- A recent report by the Applied Economics Clinic found that[34] even ramping up to moderate levels of energy efficiency would enable Virginia's largest utility to achieve the 10% goal by 2020.[35] With the substantial increase in energy efficiency spending requirements contained

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[32] *Id., p.3.*

[33] Applied Economics Clinic, Missed Opportunities for Efficiency in Virginia (Feb. 1, 2018), at 1 (citing Governor's Executive Committee, Virginia Energy Efficiency Roadmap Policy and Program Recommendations (Apr. 6, 2017), at Slide 3, available at https://www.dmme.virginia.gov/de/LinkDocuments/GEC/4%20-%20Virginia%20Energy%20Efficiency%20Roadmap.pdf). In Dominion's 2017 Integrated Resource Plan (IRP), State Corporation Commission (SCC) staff witness Eichenlaub testified that, based on current programs, Dominion Energy could achieve only 80% of the 10% reduction target by 2032—still deficient a decade late. See http://www.scc.virginia.gov/docketsearch/DOCS/3h7%2301!.PDF (p. 19-20). Even apart from efficiency programs, greatly overstate its load growth and should not be relied upon for estimating demands in 2020 or beyond. See testimony of William Shobe in 2017 Dominion's IRP, which is cited above.

[34] Applied Economics Clinic, *Missed Opportunities for Efficiency in Virginia* (Feb. 1, 2018), at 1 (citing Governor's Executive Committee, Virginia Energy Efficiency Roadmap Policy and Program Recommendations (Apr. 6, 2017), at Slide 3, available at https://www.dmme.virginia.gov/de/LinkDocuments/GEC/4%20-%20Virginia%20Energy%20Efficiency%20Roadmap.pdf).

[35] *Id.*

in recent legislation, significant increases in efficiency progress should be built into the 2020 cap and later reductions.[36]

- Other indicators of the efficiency gap that warrants a lower 2020 baseline include:
    - According to the electric utility industry's research organization, Virginia has captured only 2% of its efficiency potential, ranking near the bottom out of 50 states and the District of Columbia.[37]
    - Virginia's largest investor-owned utility, Dominion Energy, ranks 50th (next to last) in efficiency efforts among the 51 largest electric utilities in the nation, according to the American Council for an Energy-Efficient Economy (ACEEE).[38]
    - In contrast to Virginia, RGGI states ranked 1st (Massachusetts); 3rd (Rhode Island); 4th (Vermont); 6th (Connecticut); 7th (New York); 10th (Maryland); 13th (Maine); 21st (New Hampshire); and 24th (Delaware)[39] in ACEEE's most recent State Energy Efficiency Scorecard, while Virginia ranked 29th overall with zero out of 20 possible points for utility energy efficiency offerings.[40] ACEEE estimates that the state only achieved energy savings reflecting 0.10 percent of retail sales. Top-performers in the northeast have achieved upwards of 3 percent and the median in the U.S. is 0.67 percent.[41]
    - Using two measures, a 2016 independent survey of the 30 largest investor-owned utility companies ranked Dominion last for energy efficiency.[42] Benchmarking analysis by Ceres highlighted how far behind its peers Virginia's primary utility, Dominion, is lagging in its energy efficiency offerings.[43]

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[37] Electric Power Research Institute, *State Level Electric Energy Efficiency Potential Estimates* (Washington, DC: EPRI, 2017), https://www.epri.com/#/pages/product/000000003002009988/.

[38] American Council for an Energy-Efficient Economy, *Utility-Sector Energy Efficiency Performance in the Commonwealth of Virginia* (Washington, DC: ACEEE, 2017), http://aceee.org/sites/default/files/va-utility-sector-memo-1217.pdf . Dominion Energy earned only 11% of total energy efficiency points (5.5 out of 50) and performed far worse than peer utilities in the Mid-Atlantic region (MD, NJ, PA, and VA). In contrast, Maryland's BG&E utility company ranks 4th nationally.

[39] ACEEE State Energy Efficiency Scorecard, http://aceee.org/state-policy/scorecard.

[40] *See* ACEEE State and Local Policy Database: Virginia, https://database.aceee.org/state/virginia.

[41] ACEEE State Energy Efficiency Scorecard, http://aceee.org/state-policy/scorecard.

[42] Ceres, *Benchmarking Utility Clean Energy Deployment: 2016 – Ranking 30 of the Largest U.S. Investor-Owned Electric Utilities on Renewable Energy and Energy Efficiency* (Washington, DC: Ceres, June 27, 2016), https://www.ceres.org/sites/default/files/reports/2017-03/Ceres_BenchmarkCleanEnergy2016_071116.pdf.

[43] Ceres, Benchmarking Utility Clean Energy Deployment: 2016: Ranking 30 of the Largest U.S. Investor-Owned Electric Utilities on Renewable Energy & Energy Efficiency (June 2016), at 4. Ceres conducted a benchmarking analysis in 2016 of 30 holding companies representing 119 electric utility subsidiaries and accounting for nearly 60 percent of total U.S. electric industry sales in 2014. In Ceres' benchmarking of large utilities, Dominion ranked last for incremental energy efficiency as a percentage of retail sales, achieving 0.1 percent annual energy savings as compared to a mean of approximately 1.0 percent and nearly 1.9 percent savings for the leading utility, Eversource Energy. The utilities operating in the RGGI region all achieved significantly greater incremental energy savings than Dominion: Eversource (1.87%), National Grid (1.59%), Exelon (1.42%), FirstEnergy (0.91%), Berkshire Hathaway (0.92%), PSEG (0.71%), ConEd (0.38%). Dominion also ranked last in life cycle energy efficiency savings as a percentage of retail sales, achieving only 1.5 percent, as compared to a mean of approximately 10 percent and over 20 percent for the leading utility, Eversource Energy. Again, Dominion lagged far behind its counterparts in the

In short, Virginia should not reward its utilities with a higher baseline for CO_2 emissions, which would elevate emissions caps for at least a decade, based upon an indifferent approach to efficiency over the past decade. Under recent legislation, investor owned utilities will be required to increase spending on efficiency. That will make it easier to reduce emissions from a lower baseline than the one proposed for 2020.

In summary, a baseline CO_2 cap below 30 million short tons would reflect reasonable assumptions about the state's emissions trajectory through 2020, independent of any effort to join RGGI.

2. Biomass generation should be covered by the cap and allowance requirements.

We strongly support the proposed definition of "fossil fuel-fired" which would already cover most *co-firing* of biomass and fossil fuels. This results from proposing to define "fossil fuel-fired" as "the combustion of fossil fuel, where the fossil fuel combusted comprises, or is projected to comprise, more than 10% of the annual heat input on a Btu basis during any year."

However, as discussed below, *the requirement to purchase CO_2 allowances should be extended to cover all biomass generation meeting the otherwise applicable size requirements (25 MW for existing generation or 15 MW for new sources). At a minimum, the requirement to purchase allowances should extend to new and existing biomass-fueled units, particularly those that burn wood-based biomass, whether in pellets or other forms.* Wood-based biomass is the least likely to result in CO_2 recapture within a time frame helpful to avoiding the looming climate crisis.

The implicit premise for exempting generators that burn biomass is that the emitted CO_2 will eventually be recaptured by regrowth of the feedstock and that is somehow sufficient to mitigate the climate damages from current CO_2 emissions.[44] Those assumptions are faulty in several respects:

- Biomass burns less efficiently than coal or natural gas so more biomass must be burned to produce each MWH of electricity. As a result, **the CO_2 emissions per MWH of electricity generated from biomass are substantially higher than from coal and natural gas. Combining EIA's generation numbers with EPA's CO_2 emission numbers, we calculate 2016 CO_2 emission rates (lb CO_2/MWh) for three Virginia wood steam plants (converted from coal) as:**

RGGI region: Eversource (20.20%), National Grid (17.74%), Exelon (16.17%), Berkshire Hathaway (10.05%), First Energy (8.81%), PSEG (7.16%), Con Edison (6.30%).

[44] See, e.g., Booth, "Not carbon neutral: Assessing the net emissions impact of residues burned for bioenergy," *Environ. Res. Lett.* 13 (2018) 035001 https://doi.org/10.1088/1748-9326/aaac88 ; NRDC (Nathanael Greene), "Biomass: Not Carbon Neutral and Often Not Clean," (April 08, 2014); PFPI, "The Myths that Sustain the Biomass Energy Industry "Renewable – Sustainable - Carbon Neutral" http://www.pfpi.net/carbon-neutral-think-again (2011); Manomet "Biomass Sustainability and Carbon Policy Study" (2020) https://www.manomet.org/sites/default/files/publications_and_tools/Manomet_Biomass_Report_Full_June2010.pdf Pearce, "Carbon Loophole" (2017) https://e360.yale.edu/features/carbon-loophole-why-is-wood-burning-counted-as-green-energy ; https://grist.org/article/e-u-loophole-counts-wood-energy-as-carbon-neutral-its-not/ (2017);

Southhampton - 3292 lb CO_2/MWH; Altavista - 3140 lbCO_2/MWH; and Hopewell Power station 3204 - lbCO_2/MWH. This compares to common values for most coal plants in 2200 lb/MWH range, except for a few very old plants. Values for combined cycle natural gas plants may run as low as 800 lb/MWH.

- Co-pollutants from biomass combustion are large and harmful to human health.

- Gradual deterioration of wood residues would occur over many years, but the net CO_2 emissions impacts from burning even wood residues remain large over 50 years or more.
- Adverse climate and health impacts from current emissions from burning biomass will not be offset by resequestration of CO_2 decades in the future – even assuming that the biomass is replaced with comparable forests.
    - Trees take many decades to regrow and recapture the CO_2 sequestered in existing forests, with much less sequestration by seedlings and small trees.
    - We must reduce GHG emissions now, not merely achieve an accounting balance decades down the road. Climate changes are projected to become catastrophic and irreversible within the next 10-20 years if we do not cut CO_2 emissions now.
    - The harms will last for centuries given the long-term persistence of CO_2 in the atmosphere.
    - By way of illustration, ice sheets and glaciers will not return nor will higher sea levels subside nor will lost-lives be restored even if trees resequester an equivalent quantity of CO_2 40-100 years from now.
    - Similarly, harms from ocean acidification will not be resolved by future growth of forests.
- Exempting biomass from carbon prices would undercut beneficial investments in zero-carbon alternatives, such as solar, wind and energy efficiency, which mitigate climate harms in both the near-term and long-term.
- There is no support for the implicit assumption that forests will be regrown in a sustainable way or in sufficient quantities to recapture that CO_2 is emitted during the life of this program.
    - Nothing in the proposed rule would require that forests be regrown or that DEQ monitor and enforce regrowth promises, if any, over the next 50-100 years.
    - Claims that biomass will be drawn from “forest residues” are talking-points, not obligations that are audited or enforced.
    - Even if only “forest residues” were burned, there would be a negative climate impact over the next 50 or more years, particularly since exempting wood residues and pellets from CO_2 prices would increase the economic incentives to harvest whole trees, including mature ones that sequester the most CO_2.
    - Cutting of trees to meet biomass demand would be even more harmful than so-called “residues”, but nothing in the proposed rule would prevent that from happening.

- Since converting biomass into wood pellets and transporting the pellets takes energy, recapturing the CO_2 from biomass require more than a one-for-one replacement.

Furthermore, contrary to an argument made in the ED11 process, past investments in large biomass facilities do not deserve special treatment any more than past investments in fossil-fuel fired generating facilities. The public and climate are harmed by CO_2 emissions in both cases. The climate crisis will never be resolved if previously built emitters are granted exemptions. In any event, under the rule, value of allowance auction revenues can be passed through to customers to mitigate cost impacts.

3. CO_2 reductions should continue beyond 2030.

To assist long-term planning by generators, regulators and the public and to achieve the CO_2 reductions that scientists have shown will be needed, ***the final rule should be amended to require continued annual reductions of the CO_2 cap, beyond 2030, at the same annual quantities as from 2021-2030, until the rule is modified.***

This could be achieved by altering the proposed language in proposed 9VAC5-140-6190.C to state: "For 2031 and each succeeding calendar year, the Virginia CO_2 Budget Trading Program base budget **will be reduced by the same annual quantity as the reduction between 2029 and 2030**." Corresponding changes would be needed to Table 140-5A and Table 140-5B. Continuing to reduce CO_2 at the same annual rate would mean a reduction of approximately 1 MM short tons/year, which would achieve a 90+% reduction by 2050. That level of reduction is needed to mitigate climate damages and is justified whether or not modified later. However, the annual reduction quantity could be changed by rule if appropriate. The key is to clearly indicate that reductions will continue until climate stabilization is achieved.

If a *specific* post-2030 target is desired then the rule could provide that yearly reductions of the annual cap will continue, for example, *either* (a) until the emissions cap on covered sources has been reduced by 90% from the 2020 base budget ***or*** **(b)** until the emissions cap on covered sources has been reduced by the same percentage as has been achieved by long-term RGGI member states relative to their pre-auction emissions. Since RGGI's announced 2030 reduction target is more than 65% below its 2009 cap the latter measure would continue reductions until at least that percentage of emissions reduction is achieved in Virginia—or until greater reductions are achieved if RGGI extends its annual reductions beyond 2030. This would assure that Virginia eventually catches up with a level of reductions that RGGI has shown are achievable. At minimum, it is necessary to clarify in the rule that the emissions trajectory post-2030 will be at least as stringent as that agreed to by the RGGI states in subsequent program reviews for the post-2030 years. Absent emission reductions that continue to at minimum match the stringent of the RGGI program beyond 2030, Virginia would be unable to continue to link its program with the RGGI states and reap the benefits of the larger carbon market.

There are several reasons the rule should provide, **now**, for continued CO_2 budget reductions beyond 2030, not await a new rulemaking 5-10 year from now.

- We know from the science that *much greater* CO_2 reductions will be needed as we head toward 2050, just to keep worldwide temperatures from rising 2.0°C above pre-industrial levels. The 2008 Governor's Climate Commission's Report recognized that an 80% reduction below 1990 levels would be needed by 2050,[45] but a decade's delays in commencing reductions mean that a deeper reduction will be needed by 2050 in order to overcome the period of inaction. Indeed, a recent report shows that we are on track for worldwide temperature increases over 3.0°C by 2100 if we do not greatly accelerate our reductions of GHG emissions.[46]
- Scientists and the Paris Agreement, which the McAuliffe Administration said Virginia would follow, call for large GHG reductions between now and 2050, and net-zero emissions sometime after 2050. It set a goal of keeping worldwide warming "well below" 2.0°C, ideally below 1.5°C. The U.S. submission to the Paris negotiations acknowledged a national long-term (2050) goal of reducing CO_2 by 80% *economy-wide* from 2005 levels. Although President Trump has said the U.S. will withdraw from the Paris Agreement in 2020, when permitted to do so, the science nevertheless says that dramatic CO_2 reductions will be needed to avoid a catastrophic increase in temperatures and sea levels. Virginia's regulations must be based on the weight of *scientific* evidence, not some politicians' wishful thinking.
- Utility planning for long-term investments (35-60 years for much generation and transmission) needs long-term guidance that the CO_2 emissions cap will continue to decline well beyond 2030. *Both utilities and regulators need that guidance.* In its 2017 IRP, Dominion projected *rising* CO_2 emissions for the next 25 years, with a witness explaining: "The Company follows all effective and anticipated environmental regulations concerning emissions." Since utilities can shift stranded costs risks to captive customers, they need clear regulatory guidance to shape their long-term investments.[47]
- The danger of inducing long-term polluting investments is made worse by fact that a Dominion's affiliate is building a large natural gas pipeline with a 35-60 year life, at a cost exceeding $5 billion, which it will want to fill with natural gas and charge to Virginia rate payers for decades into the future. *Without "effective and anticipated environmental regulations" stating that CO_2 reductions will continue beyond 2030, Virginia risks having its*

[45] Governor's Commission on Climate Change, *Final Report: A Climate Action Plan* (Dec. 15, 2008), p. 14. This report remains substantially correct today in its warnings of climate risks and its identification of available measures to reduce GHG emissions, including clean energy, energy efficiency and creating a cap-and-trade program. Inaction since then has resulted in growing risks today.

[46] United Nations, *The Emissions Gap Report 2017* (November 2017) p.xviii.

[47] Above, we quote Professor Shobe's observation about the harmful impacts of inflated demand expectations: "Because the Company uses the forecast for long-term capital planning, a forecast with a large and consistent upward bias will likely result in poor capital planning choices and must be seen a damaging to the public interest." The same damage to the public interest would arise from creating mistaken expectations about future CO emissions.

utilities pursue investments that help their investors, but not the public's need for accelerating CO_2 (and associated methane) emission reductions.

- *Non-utility investors in power generation and in all long-term forms of energy-consuming property--including builders and buyers of buildings, equipment and homes—also need long-term carbon reduction guidance.* It is better to provide forward-looking regulatory and price signals that encourage timely investments in renewable energy and efficiency than to pretend that CO_2 caps are likely to stay flat after 2030.
- Continued participation in the RGGI market may not be sustainable if Virginia stops reducing CO_2 emissions before it has achieved total reductions at least as stringent as continued reductions by the RGGI states.

4. Environmental Justice

Climate change disproportionately harms the poor and other disadvantaged communities. Moreover, residents near and downwind of fossil-fuel power plants, particularly coal plants, suffer disproportionate health impacts from co-pollutants, including particulates, SO2, ground-level ozone, mercury and other air emissions. The victims of such pollution are disproportionately low-income or minority, further disadvantaging them and their children. This has been well documented by EPA and others.[48] As noted above, generating electricity with biomass also produces high levels of harmful air pollution, and the possibility of trees resequestering CO_2 over a period of decades does nothing to mitigate pollution harms to children and adults today. In contrast, solar, wind and efficiency do not produce any carbon pollution or co-pollutants.

Over half a million people in Virginia live within three miles of a power plant that was to be covered by the Clean Power Plan. Of these, 52% are minority and 34% are low-income, while Virginia has a total minority population of 35% and low-income population of 26%. Five Virginia power plants received an "F" for environmental justice performance based upon power plant impacts on low-income and minority communities, as reported in the NAACP's *Coal Blooded: Putting Profits before People* report (2016).[49] Power companies were also scored, and Dominion ranked 6th worst among all the companies reviewed nationwide. According to the U.S. Office of Minority Health, black people are three times more likely to die from asthma-related causes than white people.

Capping and steadily reducing aggregate CO_2 emissions and co-pollutants will generally improve health outcomes in Virginia and benefit all communities, including disadvantaged communities. This positive benefit from reducing CO_2 emissions has been documented in RGGI states, which have experienced improvements in health outcomes since RGGI's carbon limits

[48] As EPA's Clean Power Plan recognized (p.44), "Climate change is an environmental justice issue. Low-income communities and communities of color already overburdened by pollution are disproportionately affected by climate change and are less resilient than others to adapt to or recover from climate-change impacts." See also EPA, "Climate Change, Health and Environmental Justice" (May 2016).

[49] http://www.naacp.org/wp-content/uploads/2016/04/Coal_Blooded_Executive_Summary_Update.pdf; https://www.naacp.org/wp-content/uploads/2016/04/CoalBlooded.pdf

took effect. [50] RGGI states have also seen dramatic reductions in SO2 emissions since RGGI's carbon limits took effect.[51]

However, it remains possible that trading could allow some dirty fossil fuel plants to use allowances to continue or even increase polluting operations. As a result, localized harms may occur even if the rule produces overall progress. Low-income and minority communities may be particularly affected, as they have been with pollution concentrations generally.

Because local concentrations could arise under a trading regime, it is critical that DEQ commit in the final rule:

- To conduct environmental justice and emissions studies, with full public participation, of actual experience with emission patterns and concentrations at the local level;
- To continuously monitor and report concentrations of both CO_2 and non-CO_2 -pollutants in order to be sure that disproportionate concentrations do not develop and inadvertently harm particular communities or regions;
- To investigate detected concentrations as well as any complaints of disproportionate local impacts and to utilize its authority to pursue appropriate remedial actions, potentially including orders directing reductions of emissions from particular generating facilities. **(See Appendix B for suggested regulatory language.)**

As an additional precaution, we urge DEQ to consider amending the final rule to prohibit the dirtiest of plants – ones fired with coal, biomass or heavy oil – from acquiring allowances to increase their annual emissions over historic levels without first obtaining a permit to do so.

5. The rule's coverage should be clarified for existing generation and should be modified for new generators

The proposal to cover existing units serving a generator of 25 MWe or larger is generally consistent with RGGI's existing rule. However, the proposed rule should be amended in two respects to strengthen its impacts and prevent evasions. **(See Appendix B for language suggestions.)**

a. ***The rule should be clarified to state that the 25 MWe threshold only needs to be crossed once to trigger coverage by the rule.*** This is important so that coverage cannot be avoided through manipulation of a unit's size or configuration. To do this, the proposed 9VAC5-140-6040A should be modified to state that the rule covers units serving all generators having a nameplate capacity of 25 MWe or more **"at any time on or after"** a fixed date.

To be consistent with RGGI's model rule, it would be reasonable to adopt January 1, 2005 as the "on-or-after" date. Alternatively, the "on-or-after" date could be shortly

[50] Acadia Center (2017) at.5; Abt Associates, Analysis of the Public Health Impacts of the Regional Greenhouse Gas Initiative 2009-2014, http://abtassociates.com/AbtAssociates/files/7e/7e38e795-aba2-4756-ab72-ba7ae7f53f16.pdf

[51] Sierra Club review of available data for six areas in RGGI (within Maryland, Delaware, Connecticut and New York) showed they experienced a 69%-98% reduction in SO□ from 2008-2015.

prior to the first notice that a plant might be covered by CO_2 regulations (e.g., January 1, 2014, which would have been shortly prior to the proposal for the Clean Power Plan, which may have created a regulatory incentive to manipulate a generator's size or configuration). In any event, facilities should not be able to evade compliance by making changes that would alter a facility's size or configuration.

b. ***The proposed rule should be modified to require <u>new units</u> serving generators with a nameplate capacity less than 25 MWe to obtain emissions allowances. We suggest the threshold for new generators be set at 15 MWe or less.*** This is needed in order to send CO_2 regulatory and price signals to a broader pool of *new* generators and to prevent gaming that would undermine the regulation's CO_2 reduction goals and that would be unfair to existing generators covered by the rule. Within the RGGI region, there are examples of recent proposals for multiple generation fossil fuel-fired units each just below the 25 MWe compliance threshold.[52] Since economic efficiencies and operating efficiencies would ordinarily support larger units, the sizing appears clearly to be driven by a desire to emit CO_2 without limits, thereby undercutting public health and the goals of the regulations.

Since it is essential that we reduce future emissions, there is no reason to encourage any new generation that emits CO_2. With a lower size threshold for coverage of new units, the final rule would better protect the public from CO_2 and co-pollutants, remove an unintended incentive for building less efficient fossil fuel generators, and protect the integrity of allowance markets. Since developers would have notice of the allowance requirement for new generation, no unfairness would result from imposing a lower size threshold for such generation. We submit that units placed in service after January 1, 2019 (or, at most, two years after the proposed rule was announced) would fairly be considered "new".

6. Conditional Allowances and monitoring use of funds from allowance auctions.

a. Tracking use of revenues from allowance auctions.

Allocations of conditional allowances is a pragmatic choice designed to implement tradable emissions allowances. However, recipients of economically-valuable conditional allowances should be encouraged to use that value to promote the broader carbon-reduction purposes of the rule, not to produce windfalls. The proposal presumes that utilities will utilize revenues received from the consignment-and-auction process for the benefit of their customers—either through incremental investments in energy efficiency or zero-carbon generation or applying the revenues to reduce retail rates. While this seems to be a reasonable assumption, in

[52] For example, MIT recently proposed two 22 MW combustion turbines. *See* Draft Prevention of Significant Deterioration Permit Application No. NE-15-018 Transmittal No.: X262144, available at http://www.mass.gov/eea/docs/dep/air/approvals/final2017/mit-dpsd.pdf; Air Quality Plan Approval, Application No. NE-15-018, Transmittal No.: X262144 (June 21, 2017), available at https://powering.mit.edu/sites/default/files/images/CUP%20MassDEP%20approval%20cover%20letter.pdf

light of SCC regulation of utilities, it is not a guarantee either for utilities or for non-utility generators.

To this end, ***DEQ should monitor how the auction revenues are utilized by recipients of conditional allowances and initiate a future proceeding to consider adjusting the method for allocating allowances if the revenues are not used to advance the purposes of the rule.*** In order to effectively monitor the impacts and benefits of distributing conditional allowances and the uses of revenues from auctioning them, **all recipients of such allowances should be required to report annually how the auction revenue funds were used by the recipient,** including whether they were passed through to retail customers, used to reduce CO_2 emissions, or used for other corporate purposes or retained as earnings. **(See Appendix B.)**

Generators in other RGGI states do not expect funding from the auctions; and Virginia companies should not get auction revenues unless they promote the purposes of the rule. They should not continue to receive conditional allowances and associated revenues, if they merely pocket the revenues or use them to subsidize continued emissions.

b. Consignments to holders of contracts with DMME.

The Virginia Sierra Club supports the proposal to consign a portion of the conditional allowances to holders of public contracts with DMME "for the abatement and control of air pollution, specifically CO_2." RGGI member states use a much larger share of their auction revenues for such purposes by supporting measures to increase energy efficiency or zero-carbon renewable energy within their borders. It is reasonable for Virginia to do so with at least part of the revenues from the consignment auction process.

Nevertheless, 5% is a small starting point. Consideration should be given to reallocating conditional allowances from non-utility generators or utilities to public contractors for implementing energy efficiency and renewable energy, particularly if the covered generators do not invest their auction revenues to expand zero-carbon energy solutions in Virginia.

7. Consider permitting opt-ins at least for Dominion's Mt. Storm Power Plant.

RGGI's policies do not appear to bar states from allowing opt-ins by electric generators that would not otherwise be covered. Dominion has a large coal-fired electric generating facility (Mt. Storm) located just across the border in West Virginia. The Mt. Storm facility is included in Virginia retail rates for all purposes and is dispatched through PJM like other Dominion facilities.

DEQ should consider inviting Dominion to include Mt. Storm as a CO_2 budget source subject to all the requirements of the CO_2 Budget Trading program, provided that the arrangement does not violate any West Virginia CO_2 emissions rule and is acceptable to RGGI. Voluntary inclusion in the program could be implemented by contract. By agreeing to abide by the program, Dominion would receive a share of consigned conditional allowances, follow all the rules (including emissions monitoring and reporting), and be required to purchase allowances to match the CO_2 emissions from that plant. Its bidding into the PJM energy and capacity

auctions would need to include the costs of such allowances in order to assure that dispatching decisions reflect the incremental cost of production. It would need to agree to abide by the rules as long as the plant and Virginia's regulations continue to operate or until it is required to join a superseding CO_2 regulatory regime in West Virginia. Its CO_2 authorized account representative would need to be located in Virginia.

Dominion may find it reasonable to bring its Mt. Storm coal plant into Virginia's consignment auction and carbon cap. The plant is old and a substantial source of CO_2, as well as other pollutants many of which blow into Virginia. We are not aware of any barrier to Dominion's agreeing to subject this plant to Virginia's CO_2 allowance program, which would affect PJM's economic dispatch of the plant, but not require any specific plant modifications or state permits, as far as we are aware. Dominion and its customers could benefit from phasing down Mt. Storm's operations and shifting CO_2 allowances to newer, cleaner facilities located in Virginia.

8. The Proposed Rule Sensibly Does Not Open the Door to Offsets.

The proposed rule wisely does not provide for creating offset allowances. Offset allowances would require large investments of Virginia's administrative resources to analyze, approve and enforce proposals. Illustrating the complexity, nearly 30% of the RGGI Model Rule's text is devoted to the standards and procedures for evaluating, conditioning, approving, enforcing and accounting for potential offset projects. That is not a burden that Virginia should take on, particularly since it may require expertise of physical and economic processes beyond those DEQ normally oversees.

Further, the value of proposed offsets are dubious. Even if they work to reduce CO_2 somewhere, offset schemes may not provide valuable ancillary benefits from reducing power plant emissions of CO_2, including the health benefits from reducing co-pollutants. Indeed, offset projects may increase the danger that local pollution will increase as a result of purported CO_2 reductions at remote locations. This has happened under California's program, which allows offsets.

C. Suggested Clarifying Changes (For regulatory language, see also Appendix B).

The following section describes several clarifying changes to the regulations in order to effectuate its intended goals. **For the reviewers' convenience, detailed language suggestions for these clarifications (and some previously discussed modifications) are contained in Appendix B to these comments.**

1. Clarify 2020 Compliance Period

The proposed regulations clearly contemplate a one-year "initial control period" in 2020 and three-year control periods thereafter and CO_2 emissions limitations in every year beginning 2020 and continuing beyond 2031. This is apparent from various sections, including 9VAC5-140-6190.A.1, which sets a base budget for 2020, 9VAC5-140-6210.C describing the maximum

number of allowances available for years 2020-2031, and 9VAC5-140-6210.H.1 describing "the initial control period (2020).

However, confusion may arise from the combination of (a) definition of "control period" which refers to the three-year periods beginning 2021, but not the one-year "initial control period" beginning January 1, 2020 and (b) language in other sections (e.g. 9VAC5-140-6050.C and 9VAC5-140-6260.A, which describe limitations on emissions by covered sources during "control periods" and "interim control periods". The failure to mention the initial control period could produce the absurd result that conditional allowances are allocated and consigned for 2020 but no obligation follows to acquire actual allowances from RGGI. That plainly is not the intent.

To fix this gap, the rule should be amended either (a) to refer also to the "initial control period" each time compliance is discussed for "control periods" or (b) to amend the definition of "control period" to include the "initial control period." **See Appendix B for language to implement the latter approach.**

2. Implementation of conditional allowances

a. Consistent wording. For the sake of clarity, the wording of the final regulations should refer consistently to either (a) allocations to DMME for holders of public contracts or (b) allocations to holders of public contracts designated by DMME. The latter appears to be the better choice.

b. Establishing accounts. Separate accounts should be established for conditional allowances (which go to both covered generators and to holders of public contracts with DMME) and CO2 allowances purchased at auction or in private markets and available for use to cover emissions (which will not be purchased by holders of public contracts).

c. Maturing of conditional allowances. The final rules should clarify when conditional allowances become regular allowances usable for compliance. The proposed rule sometimes states that conditional allowances become regular allowances when consigned to auction (*e.g.*, proposed 9 VAC5-140-6020 C and 9VAC5-140-6190 B), and sometimes states that they become regular allowances when sold in the auction (*e.g*., proposed 9VAC5-140-6430).

Although no allowance is useful until purchased in RGGI's auction, **the proposed definition of "Conditional allowance" should clearly indicate that conditional allowances become usable allowances *when they are consigned to RGGI*** *by a budget source or by a holder of a public contract with DMME*. In that way, it will be clear that RGGI is selling fully usable allowances. RGGI's market should not be complicated by auctioning Virginia's conditional allowances under separate labels from all other allowances. This is as it should be since all allowances will be interchangeable and tradable once purchased at auction. **Language to implement these clarifications is set forth in Appendix B**. [2]

3. Missed reference to allocation to DMME

Section 9VAC5-1406215 B should be amended to state that for each control period, "the department will allocate to all CO_2 budget units that have a net electrical output (as determined under subsection A of this section) a total amount of CO_2 conditional allowances equal to **95% of** the CO_2 base budget." This change is needed since 5% will be allocated to holders of public contracts with DMME.

4. Accounting for conditional and usable allowances

The proposed rule provides for establishing "compliance accounts" for budget sources. See, e.g., 9VAC-140-6220 A, 9VAC-140-6230 A, 9VAC-140-6250 A and B. Establishing and maintaining such accounts is both reasonable and necessary. However, accounts showing distributions and dispositions should also be established for conditional allowances. Accounts should be established and maintained for holders of public contracts that receive conditional allowances and auction revenues.

5. Use of allowances from other states

The final rule should be clearer that Virginia's CO_2 budget sources are permitted to acquire RGGI allowances from other states. That is the point of linking to RGGI's market, and it is clearly the intent of the proposal. This requires clarifying language since the proposed definition of "CO_2 allowance" only refers to Virginia-issued allowances. **Suggested language is set forth in Appendix B.**

Ideally, the final rule should exclude *offset allowances* created by other states. However, if offset allowances from RGGI states can be purchased for use in Virginia, Virginia's rules need to incorporate the same aggregate limitations as are imposed by RGGI's Model Rule: *i.e.*, offset allowances may not be used for not more than 3.3% of a source's control period or initial control period emissions and 50% of a source's interim control period emission and no offset allowances may be used for deductions for excess emissions. The language in Appendix B, addresses this.

6. Exemptions for primary use at a facility

As proposed, the rule would exempt "any fossil fuel power generating unit owned by an individual facility and located at that individual facility that generates electricity and heat from fossil fuel for the primary use of the operation of the facility." *This exemption needs to be clarified and made enforceable.* In particular (**as spelled out in Appendix B**),

- The wording should be changed by replacing "heat" with "**useful thermal output,**" which should be defined (as it is by the U.S. EIA) as "**total thermal energy made available for processes and applications other than electricity generation.**"
- The final rule should require any unit seeking an exemption to submit to DEQ an exemption application and data demonstrating that it is exempt from the rule because its generated electricity and useful thermal energy are "for the primary use of the operation of the facility." The applicant should be required to provide additional supporting data

and responses to inquiries if asked. It should also be required to reaffirm its eligibility annually.

7. Trigger prices

The proposed rule sets forth CCR and ECR trigger prices that appear to be slightly different from those utilized by RGGI. Adoption of the same trigger prices would appear to be more reasonable.

8. Net electric output

Consistent with RGGI's model rule, Virginia's final rule needs additional detail imposing requirements for monitoring and reporting net electric output in order to assure that accurate data are used for allocating conditional allowances among CO_2 budget units. **Additional detail is set forth in Appendix B.**

9. Monitoring clarification

9VAC5-140-6330 C 2 has created an inadvertent timing issue that should be corrected as set forth in Appendix B.

CONCLUSION

In summary, the Virginia Chapter of the Sierra Club welcomes the proposal to implement a CO2 budget trading program that is linked to RGGI. We urge that the regulation be adopted with the modifications and clarifications suggested in these comments, including Appendix B.

April 9, 2018

Respectfully submitted,

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Sierra Club Virginia Chapter

Co-signed by the following organizations:

Peter Anderson, Virginia Program Manager
Appalachian Voices

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APPENDIX A

FACTUAL BASIS FOR ACTING NOW TO REDUCE CO_2 EMISSIONS FROM POWER PLANTS IN VIRGINIA

A. Climate Change Is Caused by Human Emissions of GHG Pollutants, Causing Growing Harms Now and Getting Worse

Climate change is real; it is caused primarily by human emissions of CO_2, methane and other GHG pollutants; it has accelerated in the past 50 years; it is already causing massive harms in the United States and around the world; it is getting worse; and we can mitigate the harms by dramatically reducing emissions of CO_2 and other greenhouse gases (GHGs).

These facts are thoroughly documented in the scientific literature, which has recognized the heat-trapping effects of CO_2 for more than 150 years. And, they are illustrated by the growing examples of catastrophic harms—which are occurring after only 1°C of average temperature increase—including from (a) massive storms, such as Hurricane Harvey (the third "500 year storm" in Houston in a three year period), Superstorm Sandy, Hurricanes Irma, Maria, Wilma and Katrina, numerous destructive typhoons in the Pacific; (b) massive, deadly wildfires in the American west, Europe, Australia, among other places; (c) severe droughts and intense rainfalls; (d) coastal flooding, including sunny-day flooding, from sea level rise; (e) accelerating melting of ice and permafrost in Arctic and subarctic regions; (f) ocean acidification and warming that is disrupting sea life and coral reefs; (g) health harms from rising temperatures and spreading diseases; and (h) famines and political and societal instability causing wars, mass migrations and terrorism.

NOAA recently reported that, in 2017, the U.S. experienced the 3rd hottest year (the hottest without an El Nino) and also the most costly in history:

> During the year, the U.S. experienced 16 weather and climate disasters with losses exceeding $1 billion, with total costs of approximately $306 billion – a new U.S. annual record. The previous costliest year for the U.S. was 2005 with losses of $215 billion driven in large part by Hurricanes Katrina, Wilma and Rita. The number of events (16) ties 2011 for most billion-dollar disasters in a single year. Some of the more noteworthy events included the western wildfire season, with total costs of $18 billion, tripling the previous U.S. annual wildfire cost record. Hurricane Harvey had total costs of $125 billion, second only to Hurricane Katrina in the 38-year period of record for billion-dollar disasters. Hurricanes Maria and Irma had total costs of $90 billion and $50 billion,

respectively. Hurricane Maria now ranks as the third costliest weather and climate disaster on record for the nation and Irma ranks as the fifth costliest.[53]

Beyond the economic toll, many lives have been lost to storms and wildfires—possibly more than 1000 in Puerto Rico.[54] Many more lives have been devastated.

Virginia may be less exposed than some areas of the world, but it has no exemption from these dangers. Virginia's coastal communities, military establishment, infrastructure and agriculture are very vulnerable.[55] Routine flooding is already occurring in the Hampton Roads area and the storm surge dangers are rising rapidly. Flooding along tidal rivers, including the Potomac River, occurs now and the risk is growing.[56] Virginia is at risk of greater sea level rise than most of the world, and worldwide sea level rise is likely to be 1 – 4 feet by 2100 with the possibility of sea levels rising by up to 8 feet.[57] Like other American taxpayers, Virginia's citizens will absorb the growing costs of repairing and hardening infrastructure and of rebuilding communities devastated by climate harms. Warmer air absorbs more moisture leading to intense downpours and flooding, as have been experienced in several parts of Virginia in recent years. Virginians' health is also at risk from rising temperatures, the expanding ranges of diseases and disease carriers, higher asthma rates, and growing disasters.

Worse, if we fail to cut GHG emissions rapidly, our descendants will suffer the consequences for centuries—too high a price to pay for protecting incumbent industries in the

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[53] NOAA, "Assessing the U.S. Climate in 2017," https://www.ncei.noaa.gov/news/national-climate-201712 . The World Meteorological Association has reported similar temperature anomalies worldwide. https://library.wmo.int/opac/doc_num.php?explnum_id=4453

[54] https://www.nytimes.com/interactive/2017/12/08/us/puerto-rico-hurricane-maria-death-toll.html .

[55] NOAA, "Patterns And Projections Of High Tide Flooding Along The U.S. Coastline Using A Common Impact Threshold" (2018). ("**Due to rising relative sea level (RSL), more and more cities are becoming increasingly exposed and evermore vulnerable to high tide flooding, which is rapidly increasing in frequency, depth and extent along many U.S. coastlines**. Today, high tide flooding is likely more disruptive (a nuisance) than damaging. **The cumulative effects, however, are becoming a serious problem in several locations including many with strategic importance to national security such as Norfolk, Virginia**, San Diego, California and Kwajalein Island in the U.S. Marshall Islands." p.vii (emphasis added).

[56] J. Samenow, "Federal report: High-tide flooding could happen 'every other day' by late this century," Washington Post, March 28, 2018, https://www.washingtonpost.com/news/capital-weather-gang/wp/2018/03/28/federal-report-high-tide-flooding-could-happen-every-other-day-by-late-this-century/?utm_term=.59d6f05c6423 .

[57] https://science2017.globalchange.gov/chapter/executive-summary/

short-term. Unfortunately, the world is on track to temperature increases exceeding 3°C by 2100, if we do not sharply reduce GHG emissions.[58]

A Climate Science Special Report was published, in 2017, as part of the Fourth National Climate Assessment, which is compiled, as required by law, by the U.S. Global Climate Change Research Program.[59] This report can be relied upon as a peer-reviewed synthesis of the results of thousands of scientific studies, papers and analyses. Its initial summary states[60]:

Highlights of the U.S. Global Change Research Program Climate Science Special Report

The climate of the United States is strongly connected to the changing global climate. The statements below highlight past, current, and projected climate changes for the United States and the globe.

Global annually averaged surface air temperature has increased by about 1.8°F (1.0°C) over the last 115 years (1901–2016). **This period is now the warmest in the history of modern civilization**. The last few years have also seen record-breaking, climate-related weather extremes, and the last three years have been the warmest years on record for the globe. These trends are expected to continue over climate timescales.

This assessment concludes, based on extensive evidence, that it is extremely likely that **human activities, especially emissions of greenhouse gases, are the dominant cause of the observed warming since the mid-20th century**. For the warming over the last century, there is no convincing alternative explanation supported by the extent of the observational evidence.

In addition to warming, many other aspects of global climate are changing, primarily in response to human activities. **Thousands of studies conducted by researchers around the world have documented changes in surface, atmospheric, and oceanic temperatures; melting glaciers; diminishing snow cover; shrinking sea ice; rising sea levels; ocean acidification; and increasing atmospheric water vapor**.

For example, **global average sea level has risen by about 7–8 inches** since 1900, with almost half (about 3 inches) of that rise occurring since 1993. Human-caused climate change has made a substantial contribution to this rise since 1900, contributing to a rate of rise that is greater than during any preceding century in at least 2,800 years. Global sea level rise has already affected the United States; **the incidence of daily tidal flooding is accelerating in more than 25 Atlantic and Gulf Coast cities**.

[58] United Nations, "Emissions Gap Report; 2016."
[59] https://science2017.globalchange.gov/
[60] https://science2017.globalchange.gov/chapter/executive-summary/

Global average sea levels are expected to continue to rise—by at least several inches in the next 15 years and by 1–4 feet by 2100. A rise of as much as 8 feet by 2100 cannot be ruled out. Sea level rise will be higher than the global average on the East and Gulf Coasts of the United States.

Changes in the characteristics of extreme events are particularly important for human safety, infrastructure, agriculture, water quality and quantity, and natural ecosystems. **Heavy rainfall is increasing in intensity and frequency across the United States and globally and is expected to continue to increase**. The largest observed changes in the United States have occurred in the Northeast.

Heatwaves have become more frequent in the United States since the 1960s, while extreme cold temperatures and cold waves are less frequent. Recent record-setting hot years are projected to become common in the near future for the United States, as annual average temperatures continue to rise. Annual average temperature over the contiguous United States has increased by 1.8°F (1.0°C) for the period 1901–2016; **over the next few decades (2021–2050), annual average temperatures are expected to rise by about 2.5°F for the United States, relative to the recent past (average from 1976–2005), under all plausible future climate scenarios**.

The incidence of large forest fires in the western United States and Alaska has increased since the early 1980s and is projected to further increase in those regions as the climate changes, with profound changes to regional ecosystems.

Annual trends toward earlier spring melt and reduced snowpack are already affecting water resources in the western United States and these trends are expected to continue. Under higher scenarios, and assuming no change to current water resources management, **chronic, long-duration hydrological drought is increasingly possible before the end of this century**.

The magnitude of climate change beyond the next few decades will depend primarily on the amount of greenhouse gases (especially carbon dioxide) emitted globally. Without major reductions in emissions, the increase in annual average global temperature relative to preindustrial times could reach 9°F (5°C) or more by the end of this century. **With significant reductions in emissions, the increase in annual average global temperature could be limited to 3.6°F (2°C) or less**.

The global atmospheric carbon dioxide (CO_2) concentration has now passed 400 parts per million (ppm), a level that last occurred about 3 million years ago, when both global average temperature and sea level were significantly higher than today. Continued growth in CO_2 emissions over this century and beyond would lead to an atmospheric concentration not experienced in tens to hundreds of millions of years. There is broad consensus that the further and the faster the Earth system is pushed towards warming, the greater the risk of unanticipated changes and impacts, some of which are potentially large and irreversible.

> The observed increase in carbon emissions over the past 15–20 years has been consistent with higher emissions pathways. **In 2014 and 2015, emission growth rates slowed as economic growth became less carbon-intensive**. Even if this slowing trend continues, however, it is not yet at a rate that would limit global average temperature change to well below 3.6°F (2°C) above preindustrial levels.

These conclusions are backed by far more detailed data and analysis in that report and the Third National Climate Assessment (2014), as well as in many other reports published around the world. [61] One of the problems identified in these reports is that the rate of climate change is not likely to be linear. There is a very real risk that climate feedbacks—warming triggering changes that accelerate the rate of warming—will drive us past a tragic tipping point. Already, for example, we are seeing warming temperatures melting permafrost, which releases massive quantities of two of the most serious GHG gases—CO_2 and methane. Similarly, warming the ocean is accelerating the rate at which ice shelves are melting, which could accelerate the rate of sea level rise.

Recent studies have led scientists to believe that sea level rise is occurring and will occur faster than previously estimated.[62] [2] With billions of people and thousands of cities along the world's coastlines, including Virginia's coastline, projected sea level increases compounded by storm surges would be truly catastrophic.

These scientific conclusions and warnings about human-caused climate change are not new. Climate warnings go back to the 1980s and earlier. .A decade ago, the Governor's Climate Commission recognized the reality of global warming, the dangers it poses, and the need to act. It recognized that the State and Nation need to reduce CO_2 emissions by 80% by 2050.[63]

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[61] See, e.g., IPCC, Fifth Assessment Report; Anderson, et al., "Beyond 'Dangerous' Climate Change: Emission Scenarios for a New World," *Phil. Trans. R. Soc. A* (2011) **369**, 20–44 (http://rsta.royalsocietypublishing.org/); The Royal Society, "What Have We Learned Since the IPCC Fifth Assessment Report (2017); EPA, "Climate Change Indicators in the United States 2016" (4th Edition); Cook, et al., "Consensus on consensus: a synthesis of consensus estimates on human-caused global warming" Environ. Res. Lett. 11 (2016) 048002;

[62] See, e.g., Hansen, et al., *Ice melt, sea level rise and superstorms: evidence from paleoclimate data, climate modeling, and modern observations that 2 _C global warming could be dangerous"* Atmos. Chem. Phys., 16, 1–52, 2016; https://www.washingtonpost.com/news/energy-environment/wp/2018/02/20/the-next-five-years-will-shape-sea-level-rise-for-the-next-300-study-says/?utm_term=.855237e6ab9b ; https://www.washingtonpost.com/news/capital-weather-gang/wp/2018/02/13/study-sea-level-rise-is-accelerating-and-its-rate-could-double-in-next-century/?utm_term=.3063dfe25df4 .

[63] *Final Report*, Governor's Commission on Climate Change p. 5,32 (Dec. 15, 2008).

Unfortunately, action has not been undertaken to reduce CO_2, methane and other GHG emissions, and the impacts and dangers have grown.

In recent years, every nation in the world joined in the Paris Climate Agreement recognizing the need for urgent reductions in GHG emissions, particularly by developed countries that have caused most of the build-up. The U.S submission committed to a 26-28% reduction economy-wide by 2025 and reiterated the long-term goal of reducing CO_2 emissions economy-wide by 80% by 2050.[64] We are far from meeting that objective and the longer we delay the harder and more costly it will be to achieve that reduction. Although President Trump has said the U.S. will withdraw, the U.S. remains a party to that agreement until at least 2020, and Governor McAuliffe committed Virginia to fulfilling the Paris Agreement's goals. Federal inaction makes state and local action to reduce GHG emissions all the more important.

The EPA's 2009 Endangerment Finding remains in place and underscores the consequences we will face if we fail to mitigate climate change by reducing GHG emissions.[65] The Endangerment Finding remains in place as a clear finding concerning the need for action to reduce GHG emissions.

The E.O. 57 process itself has established a record of testimony and comments supporting action to reduce GHG emissions. Testimony and comments, including by the Sierra Club Virginia Chapter (October 31, 2016 and incorporated by reference) cited evidence concerning (i) the magnitude and diversity of harms from inaction and delayed action (e.g., to people's health, our coastal communities, agriculture, natural environment, workers, and the economy), (ii) the irreversibility of GHG emissions and their impacts during the lifetimes of people living today and their descendants, (iii) the dangers of feedbacks and tipping points that rapidly accelerate climate harms, and (iv) the finite quantity of tolerable remaining emissions (the :carbon budget") making delayed reductions far more costly than steady reductions beginning today.

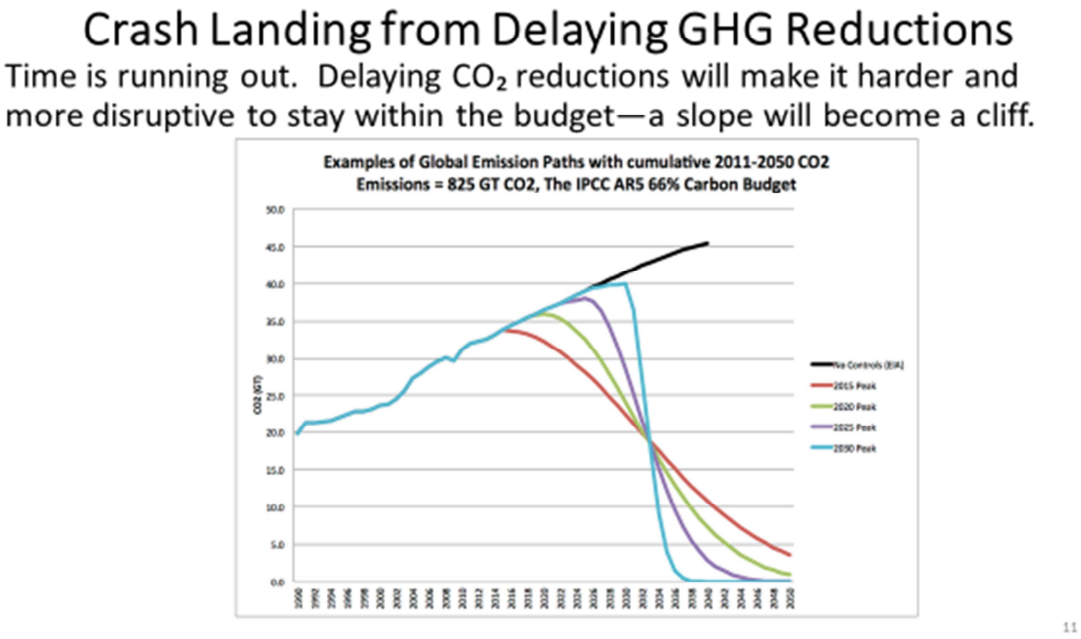
The "social cost of carbon" has been estimated (at the midrange discount rate) to be $43 per metric ton of CO_2 in 2020, rising to $52/metric ton of CO_2 in 2030 (continuing to rise

[64] The European Union's submission to the Paris climate negotiations stated its intention to reduce GHG emissions by 40% from 1990 levels by 2030, and reaffirmed its objective "to reduce its emissions by 80-95% by 2050 compared to 1990."

[65] 74 Fed. Reg. 66496 (Dec. 15, 2009) and Technical Support Document. See also USGCRP, "Climate Change Impacts in the United States" (2014) (Chapter 17 focuses on Southeastern states).

thereafter)—with the potential for costs of $128-159 at the 95th percentile.[66] The high and rising social cost of carbon supports action cutting GHG emissions now, not later. CO_2 auction prices under RGGI have not even come close to the social cost of carbon.[67]

Delaying action to reduce GHG emissions will not eliminate the aggregate reductions needed to avoid catastrophic climate harms. Instead, continued delay will lead to our needing to make steeper more costly cuts. This was graphically shown in our presentation to the E.O.57 Work Group:



In addition to compounding the risks from climate feedbacks and growing economic harms,[68] delaying the start of reductions will endanger the economy by inviting continued investments in fossil fuel generation which will have to be curtailed or closed long before the end

[66] Technical Support Document: Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866 (Interagency Working Group on Social Cost of Carbon, United States Government 2013). A lower discount rate would produce higher costs, while a higher discount rate would produce lower costs. Since we are talking about harms to our children, a lower discount rate is appropriate.

[67] In its efforts to boost fossil fuel production, the Trump Administration has withdrawn the social cost of carbon, which had been calculated by a multi-agency task force and that has been reviewed and replicated by independent experts. However, unilateral decrees do not change the facts, which were well captured by the previous estimates of the social cost of carbon.

[68] See Watson, et al., *The Economic Case for Climate Action in the United States,* FEU-US (2017). It finds that the level of economic damages from climate and weather events represent about 40% of current annual growth in the U.S., and that is projected to rise to about 50% of annual economic growth in the next decade.

of the useful lives of the facilities. Since utilities will demand cost recovery for all investments approved by the SCC, the costs of stranded and underutilized generation and transmission assets will potentially be borne by captive ratepayers, acting as a deadweight loss for Virginia's economy. Allowing that to happen would be incredibly short-sighted since the means for reducing emissions already exist and, in many cases, offer cheaper solutions than traditional utility energy supplies. Capping and reducing CO2, as successfully done by RGGI, is a critical measure to move us to the reductions we need to achieve.

B. GHG Reductions Are Economically and Practically Feasible With Today's Technology.

CO_2 reductions to satisfy a declining statewide cap can be achieved with available technologies, including solar, wind and energy efficiency. These can reduce the need for new fossil fuel generation and displace combustion that emits CO_2 from existing generation, as well as other pollutants associated with production and combustion of fossil fuels. Some of these can be co-located and operated with power plants or dispersed to areas around the state. They can be built by utilities or by third parties, including customers. Opportunities to trade emission allowances can help reduce costs of complying with a declining, statewide cap on emissions.

Economic benefits will result from the expansion of sustainable energy and efficiency use and industry growth. Further, the costs of reducing CO_2 are far lower than they were even a few years ago. Demand reductions through energy efficiency can be achieved at costs consistently below traditional energy supplies. Energy efficiency consistently ranks as the lowest-cost resource—averaging 3 cents per kilowatt hour.[69] Electricity efficiency solutions are one-half to one-third the cost of building new power plants.[70] Energy efficiency also creates jobs. Energy efficiency currently already supports over 75,000 jobs in Virginia and it could support more.[71]

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[69] Annie Gilleo, "New data, same results – Saving energy is still cheaper than making energy," December 1, 2017, American Council for an Energy-Efficient Economy, http://aceee.org/blog/2017/12/new-data-same-results-saving-energy, accessed December 19, 2017.

[70] American Council for an Energy-Efficient Economy, *The Best Value for America's Energy Dollar: A National Review of the Cost of Utility Energy Efficiency Programs* (Washington, DC: ACEEE, 2014), http://aceee.org/research-report/u1402. For additional information on energy efficiency as a resource, see the Alliance to Save Energy's *Energy 2030 Reports*, available at http://bit.ly/2BMHFl3, and McKinsey & Company's 2009 report *Unlocking Energy Efficiency in the US Economy*, available at http://bit.ly/2hf3HAM.

[71] Virginia Energy Efficiency Council, *Why Energy Efficiency is a Smart Investment for Virginia* (Richmond, VA: VAEEC, May 2017), http://vaeec.org/wp-content/uploads/2017/05/VAEEC-2017-Report-FINAL.pdf.

Virginia's 2016 Update to its Energy Plan states that robust energy efficiency policy could increase employment by 38,000 jobs by 2030.[72]

The sharp decline in costs for solar and wind generation are well documented. Wind and solar generation have grown rapidly in the U.S. and elsewhere. They support many jobs in Virginia, despite the low penetration to date, and could support many more.[73] Investments in those measures will readily enable cost-effective reductions in CO_2 as requested herein. Nor is there any technological barrier to shifting to a clean energy economy. Other utilities are reducing CO_2 at a more rapid pace and still more can be done. As the RGGI states have shown, cutting CO_2 from power plants is practical, enhances residents' health, and is compatible with strong state economies. Further, research has shown that it is possible to get to a much more energy-efficient, clean-energy electric system.[74]

In summary, we urgently need to cut emissions of CO_2 and other GHGs as rapidly as possible and as deeply as possible in order to mitigate the growing and potentially catastrophic harms from global climate change. The electric power sector is the second largest source (after transportation) and readily capable of acting to cut its emissions. Failure to act will severely harm our communities, our descendants, our natural heritage and our economy, and the harms will extend long beyond the lives of anyone living today.

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[72] Commonwealth of Virginia Department of Mines, Minerals, and Energy, *Virginia Energy* Plan (Richmond, VA: 2014), https://www.dmme.virginia.gov/DE/LinkDocuments/2014_VirginiaEnergyPlan/VEP2014.pdf. https://commerce.virginia.gov/media/7935/energy-in-the-new-virginia-economy-update-to-the-2014-energy-plan.pdf

[73]

[74] *See e.g.*, McKinsey Global, "Unlocking Efficiency in the U.S. Economy" (2009) https://www.mckinsey.com/~/media/mckinsey/dotcom/client_service/epng/pdfs/unlocking%20energy%20efficiency/us_energy_efficiency_exc_summary.ashx ; https://news.stanford.edu/news/2014/february/fifty-states-renewables-022414.html ; https://web.stanford.edu/group/efmh/jacobson/Articles/I/CountriesWWS.pdf ; https://go100re.net/wp-content/uploads/2017/05/Building-Blocks_Executive-Summary.pdf ; http://pubs.rsc.org/en/content/articlelanding/2018/ee/c7ee03029k#!divAbstract ;

APPENDIX B
SUGGESTED LANGUAGE TO IMPLEMENT RECOMMENDATIONS

The following are suggested language changes to implement the substantive and clarifying changes discussed in the body of the comments of the Virginia Chapter of the Sierra Club. **The letters and numbers correspond to those in parts B and C in the body of the text.**

B. Recommended Modifications to the Proposed Rule

B-2. Biomass, particularly wood-based biomass generation should be covered.

Extending coverage to wood-based biomass-fired plants can be accomplished as follows.

- Amend proposed 9VAC5-140-6020 C with the following:
  - **"Biomass" means wood in any form including lumber, raw wood, waste wood, residues, pellets or any solid, liquid or gaseous fuel derived from wood.**
  - **"Biomass-fired" means the combustion of biomass, alone or in combination with any other fuel, other than combustion deemed to be fossil fuel-fired.**
  - "Unit" means a fossil fuel-fired **or biomass-fired** stationary boiler, combustion turbine, or combined cycle system.

- Amend proposed 9VAC5-140 9VAC5-140-6040 A and B to cover both fossil-fuel fired and biomass-fired units. **Note that this suggested language simply adds biomass-fired units, while the language in B-5 below also addresses the size of units to be covered.** .
  - A. Any fossil fuel-fired unit **or biomass-fired unit** that serves an electricity generator with a nameplate capacity equal to or greater than 25 MWe shall be a CO_2 budget unit, and any source that includes one or more such units shall be a CO_2 budget source, subject to the requirements of this part.
  - B. Exempt from the requirements of this regulation is any fossil fuel **or biomass-fired** power generating unit owned by an individual facility and located at that individual facility that generates electricity and heat from fossil fuel **or biomass** for the primary use of operation of the facility.

B-3. CO_2 reductions should continue beyond 2030.

Three options for amending proposed 9VAC5-140-6190 C are proposed below and corresponding changes would be needed in Table 140-5A and Table 140-5B.

Option A Amend proposed 9VAC5-140-6190 C to state:

- For 2031 and each succeeding calendar year, the Virginia CO_2 Budget Trading Program base budget **will be reduced by the same annual quantity as the reduction between 2028 and 2029**.

- Corresponding changes would be needed to Table 140-5A and Table 140-5B, so that the last entry is

2030 and each year thereafter	**A quantity equal to the preceding year's**

	Budget Trading Program's base budget minus a quantity equal to the difference between base budgets for 2028 and for 2029.

Option B Amend 9VAC5-140-6190 C (with corresponding changes to the tables)

- For 2031 and each succeeding calendar year, the Virginia CO_2 Budget Trading Program base budget **will be reduced by the same annual quantity as the reduction between 2028 and 2029 until the Virginia CO_2 Budget Trading Program base budget is 10% of the base budget for 2020.**

Option C Amend 9VAC5-140-6190 C (with corresponding changes to the tables)

- For 2031 and each succeeding calendar year, the Virginia CO_2 Budget Trading Program base budget **will be reduced by the same annual quantity as the reduction between 2028 and 2029 until the Virginia CO_2 Budget Trading Program base budget has been reduced by the same percentage as RGGI's budget has been reduced for continuous member states from its initial 2009 budget.**

B-4. Environmental Justice monitoring

Add a new section such as the following (which might choose another recent base year for emissions comparisons or link to quarterly reporting):

A. Each CO_2 budget source shall notify the Department in writing if it has emitted, or anticipates that it will emit, in any period of 12-consecutive months, more CO_2 than it emitted in [2016]. Such notification shall be provided within 14 days after such an occurrence or within 14 days of projecting such an occurrence. The notification(s) shall provide: (a) emissions of CO_2, SO_2, NO_x, mercury and other regulated air pollutants for each of the most recent 12 months, (b) estimated emissions of CO_2, SO_2, NO_x, mercury and other regulated air pollutants for each of the next 12 months, (c) the reason(s) for such increases, and (d) a description of any communications with residents and community leaders about the increase(s) and their potential impacts. Additional information shall be supplied as requested by the Department. Copies of the notification(s) shall be supplied to leaders of each county and city with residents who live within 50 miles of the plant.

B. Any person may file a complaint or petition with the Department or the State Air Pollution Control Board requesting an inquiry into, and appropriate relief from, any harms resulting from such increased emissions, including orders limiting future uses of allowances that would lead to an excess of emissions above [2016] levels

B-5. Clarification of coverage

5 (a). 9VAC5-140-6040A should be modified to state that the rule covers units serving all generators having a nameplate capacity of 25 MWe or more **"at any time on or after"** a fixed date.

5 (b). To cover new units of 15 MWe or more, as well as the preceding recommendation, amend proposed **9VAC5-140-6040 A**:

> A. Any fossil fuel-fired unit **or biomass-fired unit that, at any time on or after January 1, 2005,** serves an electricity generator with a nameplate capacity equal to or greater than **(i)** 25 MWe **in the case of units placed into service before January 1, 2019 or (ii) 15 MWe in the case of units placed into service after January 1, 2019** shall be a CO_2 budget unit, and any source that includes one or more such units shall be a CO_2 budget source, subject to the requirements of this part.

B-6(a). Monitoring uses of allowance revenues is important to possible future amendments to the rules for allocating conditional allowances or even legislation. Monitoring and encouraging CO_2-reducing uses of auction revenues can be accomplished by adding a simple reporting requirement, for example, to proposed 9VAC5-140-6210:

> **J. Each CO_2 budget source and each holder of a public contract with DMME receiving conditional allowances shall submit to the Department, by March 1 of each year, a report setting forth for the preceding calendar year, (1) the auction revenues received from consigned allowances and (2) the amounts and percentages of such revenues (a) passed through to retail customers, (b) used to expand solar, wind or other renewable energy sources in Virginia, (c) used to increase consumer energy efficiency, (d) used for other identified CO_2-reduction purposes, or (e) used for other corporate purposes or retained as earnings.**

B-6(b) The final rules should be more consistent as to whether conditional allowances and revenues from consigned allowances are allocated (i) to DMME for assignment to contractors with agreements to promote the purposes of the regulations (e.g., through energy efficiency or zero carbon energy) or (ii) to the holder of public contracts with DMME. This choice should be consistent wherever such allocations are addressed, including proposed 9VAC5-140-6020 C, 9VAC5-140-6210 B, 9VAC5-140-6190 B, and 9VAC5-140-6430. For example, proposed 9VAC5-140-6210 B could be revised to read:

> B. The department will allocate 5.0% of the Virginia CO_2 Budget Trading Program base budget to **holders of public contracts with** DMME to be consigned to auction by **holders of public contracts with** DMME to assist the department for the abatement and control of air pollution, specifically, CO_2.

C. Other Clarifying changes

C-1. Clarify 2020 Compliance Period. The proposed rule should be amended either (a) to refer also to the "initial control period" each time compliance is discussed for "control periods" or (b) to amend the definition of "control period" to include the "initial control period." The latter approach could be accomplished as follows:

> 9VAC5-140-6020 C. "Control period" means **the initial control period or** a three-calendar-year time period. The first control period is from **January 1, 2020, to December 31, 2020, inclusive. The second control period is from** January 1, 2021, to December 31, 2023, inclusive. Each subsequent compliance control period shall be a sequential three-calendar-year period. The first two compliance years of each **three-calendar-year** control period are each defined as an interim control period, beginning on January 1, 2022.

C-2. Implementation of conditional allowances need clarifications of several interrelated sections. We suggest consideration of the following modifications.

> 9VAC5-140-6020C
>
> "Allocate" or "allocation" means the determination by the Department of the number of conditional allowances allocated to a CO_2 budget unit or **a holder of a public contract with** the Department of Mines Minerals and Energy (DMME).
>
> "Conditional allowance" **or "CO_2 conditional allowance"** means an allowance allocated by the department to CO_2 budget sources and to **holders of public contracts with** DMME. Such conditional allowance shall be consigned by the entity to whom it is allocated **to the department's agent for** ~~to the consignment~~ auction as specified under Article 9 (9VAC5-140-6410 et seq.) of this part ~~after which~~**and** the conditional allowance becomes ~~an~~ **a CO_2** allowance to be used for compliance purposes **when it is so consigned**.
>
> 9VAC5-140-6190 B
>
> B. The department will allocate conditional allowances to CO_2 budget units and to **holders of public contracts with** DMME. ~~After a conditional allowance has been consigned in an~~ **When a conditional allowance is consigned to** auction by a CO_2 budget unit **or** ~~and the~~ **a** holder of a public contract with DMME as specified under Article 9 (9VAC5-140-6410 et seq.) of this part, the conditional allowance becomes an allowance to be used for compliance purposes.
>
> 9VAC5-140-6210 I
>
> I. Timing requirements for CO_2 allowance allocations shall be as follows:
>
> 1. By May 1, 2019, the department will submit to RGGI, Inc., the CO_2 conditional allowance allocations **consigned to auction**, in a format prescribed by RGGI, Inc., and in accordance with **subsections A and B of this section and** 9VAC5-140-6215 A and B, for the initial control period, 2020.

2. By May 1, 2020, and May 1 of every third year thereafter, the department will submit to RGGI, Inc., the CO_2 **conditional** allowance allocations **consigned to auction**, in a format prescribed by RGGI, Inc., ~~for the applicable control period,~~ and in accordance with **subsections A and B of this section and** 9VAC5-140-6215 A and B**, for the applicable control period**.

9VAC5-140-6430

In accordance with Article 5 (9VAC5-140-6190 et seq.) of this part, conditional allowances shall be consigned by the CO_2 budget source **or the holder of a public contract with DMME** to whom they are allocated ~~or DMME~~ to each auction on a quarterly pro rata basis in accordance with procedures specified by the department. ~~At the completion of the consignment auction, a~~ **When a conditional allowance is consigned to auction, the** conditional allowance shall become an allowance to be used for compliance purposes.

C-3. A simple correction is needed regarding Section 9VAC5-140-6215 B It should be amended to reflect the fact that 5% of conditional allowances will be allocated to DMME's contractors:

the department will allocate to all CO_2 budget units that have a net electrical output (as determined under subsection A of this section) a total amount of CO_2 conditional allowances equal to **95% of** the CO_2 base budget."

C-4. Accounting for conditional allowances. The accounting provisions should be modified to explicitly incorporate accounts and measures for tracking conditional allowances, as well as CO_2 allowances acquired outside the auction process. This would require adding language to the definitions pertaining to COATS in 9VAC5-140-6020C, and to 9VAC5-140-6220 A; -6230 A; 6240; 6250 A & B and possibly other sections.

9VAC5-140-6020C

"CO_2 Allowance Tracking System" or "COATS" means the system by which the department or its agent records allocations, deductions, and transfers of CO_2 allowances **or CO_2 conditional allowances** under the CO_2 Budget Trading Program. The tracking system may also be used to track CO_2 allowance prices and emissions from affected sources.

"CO_2 Allowance Tracking System account" means an account in COATS established by the department or its agent for purposes of recording the allocation, holding, transferring, or deducting of CO_2 allowances **or CO_2 conditional allowances**.

"General account" means a COATS account, established under Article 6 (9VAC5-140-6220 et seq.) of this part that is not a compliance account **or a conditional allowance account for a CO_2 budget source**.

9VAC5-140-6220 A

A. Consistent with 9VAC5-140-6230 A, the department or its agent will establish **one conditional allowance account and** one compliance account for each CO_2 budget source **and one conditional allowance account for each holder of a public contract with DMME.** Allocations of CO_2 conditional allowances pursuant to Article 5 (9VAC5-140-6190 et seq.) of this part and deductions or transfers of CO_2 conditional allowances **or CO_2 allowances** pursuant to 9VAC5-140-6180, 9VAC5-140-6260, 9VAC5-140-6280, or Article 7 (9VAC5-140-6300 et seq.) of this part will be recorded in the **conditional allowance accounts or** compliance accounts in accordance with this section.

9VAC5-140-6230 A

A. Upon receipt of a complete account certificate of representation under 9VAC5-140-6110 **or subsection B of this section**, the department or its agent will establish a conditional allowance account and a compliance account for each CO_2 budget source **or** ~~and~~ a conditional **allowance** ~~compliance~~ account for **each holder of a public contract with** DMME for which the account certificate of representation was submitted.

9VAC5-140-6240

Following the establishment of a COATS account, all submissions to the department or its agent pertaining to the account, including submissions concerning the deduction or transfer of CO_2 allowances **or consignment of CO_2 conditional allowances** in the account, shall be made only by the CO_2 authorized account representative for the account.

9VAC5-140-6250 A and B

A. By January 1 of each calendar year, the department or its agent will record in the following accounts:

1. In **the conditional allowance account of** each CO_2 budget source~~'s~~ and **holder of a public contract with** DMME~~'s conditional allowance account~~, the CO_2 conditional allowances allocated to **CO_2 budget units at** those sources and **holders of public contracts with** DMME **for the year** by the department prior to being consigned to auction; and

2. In each CO_2 budget source's compliance account, the CO_2 allowances purchased at auction ~~by~~ **for the** CO_2 budget units at the source under **Article 9 (**9VAC5-140-~~6210 A~~ **6410 et seq.) of this part**.

B. Each year the department or its agent will record CO_2 **conditional** allowances, as allocated to the **CO_2 budget** unit **or the holder of a public contract with DMME** under Article 5 (9VAC5-140-6190 et seq.) of this part, in the **conditional allowance** ~~compliance~~ account for the year after the last year for which CO_2 **conditional** allowances were previously allocated to the **conditional**

allowance ~~compliance~~ account. Each year, the department or its agent will also record CO_2 allowances, as allocated under Article 5 (9VAC5-140-6190 et seq.) of this part, in an allocation set-aside for the year after the last year for which CO_2 allowances were previously allocated to an allocation set-aside.

C-5. Allowances from other states need to be recognized. The term "allowance" in proposed 9VAC5-140-6020 C should be amended

> "Allowance" or "CO_2 allowance" means **a limited authorization to emit** ~~an allowance~~ up to one ton of CO_2 **that was allocated by the department and consigned to auction or was offered for sale by the department or its agent in an** ~~purchased from the consignment~~ auction in accordance with **Article 5 (9VAC5-140-6190 et seq.) of this part and** Article 9 (9VAC5-140-6410 et seq.) of this part ~~and that may be deposited in the compliance account of a CO_2 budget source~~ **or that was issued by another participating state in the RGGI CO_2 Budget Trading Program, but does not include offset allowances.**

If offset allowances issued by other states are to be permitted in Virginia, the proposed rules need to include RGGI's generally applicable limits on sources' use of offset allowances; *i.e.*, use of offset allowance for not more than 3.3% of a source's control period or initial control period emissions and 50% of a source's interim control period emission and no use of offset allowances for deductions for excess emissions. Proposed 9VAC5-140-6260 A 1, 3, and 4, C 2, and D 1 will need to be revised to accomplish this.

C-6. Exemption for certain generation. The proposed rule creates an exemption for facilities that primarily have on-site uses for the electric and thermal energy. It needs to be clarified and made enforceable. Consider amending it as follows:

> 9VAC5-140-6020 C
>
> "Useful thermal output" means the total thermal energy made available for process and applications other than electric generation.
>
> 9VAC5-140-6040 B
>
> Exempt from the requirements of this ~~regulation~~ **part except this subsection,** is any fossil fuel**-fired or biomass-fired** power generating unit owned by an individual facility and located at that individual facility that generates electricity and ~~heat~~ **useful thermal output** for the primary use of the operation of the facility, **provided that the facility owner files (i) an application for the exemption, in a form prescribed by the Department, with appropriate documentation, demonstrating to the satisfaction of the Department, its eligibility for such exemption and (ii) annual updates to such application demonstrating continued qualification for the exemption. The exemption shall remain in place as long as the facility qualifies for such exemption.**

C-7 CCR and ECR Trigger Prices. The proposed rule sets forth CCR and ECR trigger prices that appear to be slightly different from those utilized by RGGI. **Adoption of the same trigger prices as are used by RGGI would appear to be more reasonable.**

C-8 Net electric output. The monitoring provisions of the final rule should include the RGGI model rule provisions (section XX-8.8) establishing additional requirements concerning net electric output. Proposed 9VAC5-140-6215 allocates conditional allowances to CO_2 budget units based on the units' three-year average "net-electric output." In order to ensure that accurate net electric output data are reported and used for these allocations, reserved section 9VAC5-140-6400 should be replaced by language adding the requirements in section XX-8.8 for monitoring and reporting of net electric output. Further, proposed 9VAC5-140-6215 C 2 should be revised to read:

2. By March 1, 2020, and each year thereafter, each CO_2 budget unit shall report yearly net-electric output data**, determined in accordance with 9VAC5-140-6400,** for the previous year.

Proposed 9VAC5-140-6180 should be revised to allow the Department to audit and adjust submissions by CO_2 budget sources and change CO_2 conditional allowance allocations where necessary to correct for errors in the monitoring and reporting of net electric output. Proposed VAC5-140-6180 B should be revised to read:

B. The department or its agent may deduct **CO_2 conditional allowances and** CO_2 allowances from or transfer **CO_2 conditional allowances and** CO_2 allowances to a source's **conditional allowance account and** compliance account based on the information in the compliance certifications or other submissions, as adjusted under subsection A of this section.

C-9. Monitoring clarification. Proposed 9VAC5-140-6330 requires a CO_2 budget unit to meet monitoring certification requirements by January 1, 2020, the commencement of the Virginia program. Some units (e.g., those commencing commercial operation shortly before, or on a date after, January 1, 2020, need an extension of that deadline in order to have time to install and certify the necessary monitoring system. However, the proposed rule's provision inadvertently only applies to a unit that commences operation on a single date and may create an excessive extension in some cases.

The RGGI model rule (Subpart XX-8.1(b)(2)) provided an extended deadline for units commencing commercial operation 6 months or less before and any time after (i.e., on or after July 1, 2008) the RGGI program's January 1, 2009 commencement and made the extension no more than 90 operating days or 180 calendar days after January 1, 2009. Virginia's proposed rule should take an analogous approach and be revised to read:

9VAC5-140-6330 C 2

2. The owner or operator of a CO_2 budget unit that commences commercial operation **on or after** July 1, **2019**~~2020~~, shall comply with the requirements of this section by (i)

January 1, **2020**~~2021~~, or (ii) the earlier of 90 unit operating days after the date on which the unit commences commercial operation, or 180 calendar days after the date on which the unit commences commercial operation.

APPENDIX C

Further Details on Assumptions for Sierra Club Estimates of ED 11 Analysis for 2016 and 2017

C 1. Assumptions

All values are based on our estimated list of EGUs in operation that will be covered by 2020, eliminating EGU's announced for retirement, primarily based on applications to PJM, and industrial cogeneration plants that likely will be exempted. (See List in Part 2 below). Exempting Industrial cogeneration units is **NOT A RECOMMDATION**, just an assumption for the purpose of estimation. In each case, we examined the total fuel consumption vs. the Consumption for electricity generation to make the decision.

CO_2 emissions are based on EPA CEMS data, where available for an EGU, and estimated values from EIA Form 923 where not. Generation estimates also are based on EIA form 923 data for net MWh. Overall emission estimates based on EIA data were close to those from EPA, but EPA's values typically are slightly higher and are based on stack measurementsCO2. Estimates include CO2 emissions from burning wood at VEPCO's VCHEC coal plant and its associated generation. Emissions and generation from the Coal units shown in Table 2 in the text includes all fuels used by each coal EGU.

C 2. List of ED 11 EGUs

Plants & Units Included in ED 11 List for analysis				
	Plant Name	**Operator Name**	Comments	EGU Units
1	Bear Garden	Virginia Electric & Power Co		1A, 1B & 1C
2	Birchwood Power	Birchwood Power Partners LP		1
3	Brunswick County Power Station	Virginia Electric & Power Co		ST01, CT01, CT02, CT03

4	Buchanan Generation LLC	Allegheny Energy Supply Co LLC		1, 2
5	Chesterfield	Virginia Electric & Power Co	Coal Units 3 & 4 to be retired, not included in Estimates	5, 6, CT7, CT8, CW7, CW8
6	Clinch River	Appalachian Power Co		1, 2
7	Clover	Virginia Electric & Power Co		1, 2
8	Commonwealth Chesapeake	Commonwealth Chesapeake Co LLC		7 Units: UNT 1 thru UNT7
9	Darbytown	Virginia Electric & Power Co		4 Units: 1 thru 4
10	Doswell Energy Center	Doswell Ltd Partnership	2 new GTs planned for 2018	7 Units: GEN1 thru GEN7
11	Elizabeth River Power Station	Virginia Electric & Power Co		GEN1, GEN2, GEN3
12	Gordonsville Energy LP	Virginia Electric & Power Co		4 Units: GOR1 thru GOR4
13	Gravel Neck	Virginia Electric & Power Co		3, 4 ,5, 6
14	Hopewell Cogeneration	GDF Suez NA - Hopewell		ST1, GT1, GT2, GT3
15	Ladysmith	Virginia Electric & Power Co		5 Units: 1 thru 5
16	Louisa Generation Facility	Old Dominion Electric Coop		5 Units: 1 thru 5

17	Marsh Run Generation Facility	Old Dominion Electric Coop		1, 2, 3
18	Possum Point	Virginia Electric & Power Co		5, 6A, 6b, 6ST
19	Remington	Virginia Electric & Power Co		4 Units: 1 thru 4
20	Tasley	Calpine Mid-Atlantic Generation LLC	Very Low Output in 2017	TAS
21	Tenaska Virginia Generating Station	Tenaska Virginia Partners LP		STG1, CTG1, CTG2, CTG3
22	Virginia City Hybrid Energy Center	Virginia Electric & Power Co		1
23	Warren County	Virginia Electric & Power Co		ST01, CT01, CT02, CT03
24	Wolf Hills Energy	Middle River Power II, LLC		5 Units: WH 1 thru WH5
25	Yorktown	Virginia Electric & Power Co		3
26	Greensville CC	Virginia Electric & Power Co	New Plant, planned operation in 2018-Not included yet	ST01, CT01, CT02, CT03
27	Stonewall CC	Green Energy Partners LLC	New Plant, in operation in 2017	3 Units: GEN1 thru GEN3